I sing
of the beauty of Athens
without its slaves

Of a world free
of kings and queens
and other remnants
of an arbitrary past

Of earth
with no
sharp north
or deep south
without blind curtains
or iron walls

Of the end
of warlords and armouries
and prisons of hate and fear

Of deserts treeing
and fruiting
after the quickening rains

Of the sun
radiating ignorance
and stars informing
nights of unknowing

I sing of a world reshaped

Niyi Osundare, Nigerian poet

University of Alberta

Information and Communication Technologies as Tools for Development: The Case of Peru

by

Magdalena Bogumila Stanislawska

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Dedicated to those I love and to the victims of human indifference.

Abstract

Information and communication technologies (ICTs) can aid the development of a nation on many levels. The following thesis focuses on the ways in which Peru is using computer technology and the Internet in the areas of economy, education, and political governance. A critical examination of the current state of ICTs in Peru and of some recent initiatives in the field reveals that in its attempts to use these technologies as tools for development, the country is still facing many challenges. Access to ICTs in Peru remains closely tied to power and wealth. Presently, computer technology and the Internet are only widening the gap between the rich and the poor and exacerbating the uneven development of different parts of the country. What Peru needs most is vision and leadership where the implementation of ICTs is concerned, accompanied by significant reforms of the nation's business environment, educational system, and political culture.

Preface

I began graduate work in September 2003, shortly after returning from my nearly four-year-long stay in Peru. During the time I spent in South America, the people, the places, and the culture I have encountered in my daily life and during my many trips to the more remote areas of Peru left a profound impression on me, at times shocking and at other times fascinating me. Upon my return to Canada, I decided to incorporate my first-hand experience in Latin America into my studies. I wanted to take a step back from what I had observed in Peru and explore further some of the questions that still lingered in my mind.

The idea for my thesis developed gradually. The years I had spent in Peru certainly served as my main source of inspiration, but the motivation for completing the project came from my deeper interest in humanitarian issues. I am well aware of the fact that this thesis will not necessarily make the world a better place. However, as long as the Third World exists, I believe it is crucial to continue the investigation of development issues. With this research project, I hope to have made my small contribution.

Acknowledgements

I would like to express my gratitude to my supervisors, Dr. Sean Gouglas and Dr. Fred Judson from the University of Alberta, for their support, encouragement, and feedback; to my Mama, for her love and all the intelligent genes she passed on to me; to my better half, for putting up with me on the tougher days and patiently listening to my whining; and to all those who in one way or another inspired me and helped me complete this project.

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List of Abbreviations

AEDES	Asociación Especializada para el Desarrollo Sostenible trans. Specialized Association for Sustainable Development
ARPA	Advanced Research Projects Agency
AVU	African Virtual University
B2B	Business-to-business
B2C	Business-to-consumer
BBC	British Broadcasting Corporation
CEPES	Centro Peruano de Estudios Sociales trans. Peruvian Centre for Social Studies
CERN	Centre Européen pour la Recherche Nucléaire trans. European Centre for Nuclear Research
CIA	Central Intelligence Agency
CIDA	Canadian International Development Agency
FAQ	Frequently asked questions
FITEL	Fondo de Inversión en Telecomunicaciones trans. Fund for Investment in Telecommunications
GCI	Growth competitiveness index
GDP	Gross domestic product
GNI	Gross national income
GNP	Gross national product
HDI	Human development index
HTTP	Hypertext transfer protocol
ICT	Information and communication technology
ICTs	Information and communication technologies
IDABC	Interoperable Delivery of European eGovernment Services to public Administration, Business, and Citizens

IDB	Inter-American Development Bank
IDRC	International Development Research Centre
IIRSA	Iniciativa para la Integración de la Infraestructura Regional Suramericana trans. Initiative for Integration of South American Regional Infrastructure
ILO	International Labour Organization
INEI	Instituto Nacional de Estadística e Informática trans. National Institute of Statistics and Informatics
INICTEL	Instituto Nacional de Investigación y Capacitación deTelecomunicaciones trans. National Institute of Research and Education in Telecommunications
INITEB	Impacts of National Information Technology Environments on Business
IP	Internet protocol
IPCE	Instituto Peruano de Comercio Electrónico trans. Peruvian Institute of Electronic Commerce
ISI	Import-substitution industrialization
IT	Information technology
ITU	International Telecommunication Union
MSB	Micro and small business(es)
MRTA	Movimiento Revolucionario Tupac Amaru trans. Revolutionary Movement Tupac Amaru
ONGEI	Oficina Nacional de Gobierno Electrónico e Informática trans. National Office of Electronic Government and Informatics
OSIPTEL	Organismo Supervisor de Inversión Privada en Telecomunicaciones trans. Supervisory Organism of Private Investment in Telecommunications
PCM	Presidencia del Consejo de Ministros trans. Presidency of the Council of Ministers
PPR	Programa de Proyectos Rurales trans. Rural Projects Program
R&D	Research and development

RCP	Red Científica Peruana trans. Peruvian Scientific Network
S&T	Science and technology
SIGA	Sistema Integrado de Gestión Administrativa trans. Integrated System of Administrative Management
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
UNDESA	United Nations Department of Economic and Social Affairs
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
URL	Uniform resource locator

Chapter 1
Introduction

1.1. Research objectives

The importance of information and communication technologies (ICTs) to the development of Third World[1] countries has been a much discussed issue for many years. Already at the first World Telecommunication Development Conference in March 1994, participants recognized the importance of telecommunications[2] to development. The final declaration signed at the conference underscores this link, perhaps best illustrated by the first two points:

> a) Telecommunications is an essential component of political, economic, social and cultural development. It fuels the global information society and economy which is rapidly transforming local, national and international life and despite physical boundaries is promoting better understanding between peoples. Thus, ITU [International Telecommunication Union] Members have the duty to provide for communications to be made available to all individuals, groups and peoples.
>
> b) New technological developments in telecommunication and information technologies have the potential to close the development gaps between developing and developed countries and, individual countries, between densely and sparsely populated areas. Telecommunications may unintentionally perpetuate the development gaps without a more determined, integrated and strategic approach to the challenges of

---

[1] Despite the rather pejorative meaning the phrase "Third World" has acquired, Smith (2003:1) argues for its usefulness. He defines the Third World as "a group of countries which have colonial histories and which are in the process of developing economically and socially from a status characterized by low incomes, dependence on agriculture, weakness in trading relations, social deprivation for large segments of society, and restricted political and civil liberties". This is also the definition I adopt. Because of the importance placed on development, I will use the phrases "Third World" and "developing nations" fairly interchangeably. I will abstain from referring to this group of countries as "the South" or as "underdeveloped nations". While the former is not accurate enough since not all developing nations are located in the Southern hemisphere, the latter clearly has negative connotations.

[2] Information technology (IT) as well as telecommunications are both part of ICTs.

> telecommunication development by governments, the private sector and international and regional organizations. (ITU, 2001)

One ICT in particular – the Internet – has become an excellent example of the enormous impact these technologies can have, especially where business, communication, and information transfer in general are concerned.

Third World countries tend to view ICTs as a tool that would allow them to accomplish three major goals leading to greater socio-economic development. Firstly, increasing their productivity and ability to compete on world markets tends to be their main priority. Increased productivity would in turn help to reduce poverty which is clearly one of the major and most persistent problems in the developing world. Second, and equally important, is improving the quality of education by providing students as well as teaching staff with more information and resources. Last but not least, creating more interaction between government institutions and citizens with the help of modern technologies is a top objective.

At the launch of the UN Task Force on Information and Communications Technology in the year 2001, Kofi Annan stated,

> The new technologies that are changing our world are not a panacea or a magic bullet. But they are, without doubt, enormously powerful tools for development. They create jobs. They are transforming education, health care, commerce, politics and more. They can help in the delivery of humanitarian assistance and even contribute to peace and security. One of the most pressing challenges in the new century is to harness this extraordinary force, spread it throughout the world, and make its benefits accessible and meaningful for all humanity, in particular the poor. (Annan, 2004)

My research project is largely based on the assumptions outlined above by the UN Secretary General. During the time I spent in Peru (1999-2003), I often came to question the politics and economics of access to computer technology and the overall impact of these technologies in Latin American societies. It is precisely

the link between ICTs and socio-economic development that is the subject of the following thesis. The main undertaking of my research has been to investigate how Peru is implementing and using ICTs as tools for development. The research focuses primarily on computer technologies such as the Internet and is based on the hypothesis that in developing countries like Peru, technology is closely associated with power and the opportunities for progress and development. Apart from the digital divide between the First and the Third World, there also exists an internal digital divide within Peru. The groups with access to the latest computer technology and the knowledge of how to use it to their advantage tend to be urban from the higher social classes. The inhabitants of the more neglected and impoverished rural areas, however, have either very little access to this kind of technology or none at all. This situation is widening the gap between the rich and the poor and exacerbating an uneven development of the different regions of Peru. In my thesis, I set out to examine critically the current state of ICTs in Peru along with some recent initiatives in the field and their effectiveness in real life. I conclude with a discussion of some possible trends for the future of development in Peru and the role that ICTs will play in it. In this introductory chapter, I will outline some key issues and concepts underlying my research along with background information on ICTs, Peru, and development.

1.2. Key concepts, issues, and definitions

1.2.1. Development

The concept of development can be defined in a variety of ways and from a number of perspectives – social, political, economic. In the decades immediately after World War II, development was often equated with economic

growth, which was in turn expected to bring about better social conditions and higher standards of living. Third World nations hence made drastic attempts to modernize by embracing industrialization, Western technology, and capitalism; by abandoning their traditional ways of life; and by becoming democratic and secular. According to the dominant belief at the time, industrialization, fueled by modern technology, would lead to increased production levels and higher economic growth. The benefits of material growth would then automatically trickle down to the masses and lead to social, political, and cultural development on all levels of society. However, already in the 1970s critical voices began to emerge. Dependency theorists[3] claimed that the development of the industrialized nations had occurred at the expense of developing countries which often fell victim to such detrimental forces beyond their control as highly competitive capitalist world markets and large international corporations. Underdevelopment was hence attributed to external causes. It was the result of unequal power relationships, with the poverty-stricken periphery being dependent on the rich developed capitalist core for its further development.

Since then, critiques of modernization theory, also referred to more generally as development theory, have abounded, and development was redefined in new ways. In the 1990s, the entire concept has come to be understood in more integral terms. The scholar and former President of Brazil Fernando Henrique Cardoso (2003) attributes this "deconstruction of the concept of development" to

> the growing perception that economic growth only proves meaningful if understood as part of a larger process. This entails respect for the environment and promotion of human rights and other collective aspirations. The notion of human development is perhaps the latest and

[3] Some the most prominent dependency theorists are Paul Baran, Andre Gunder Frank, Theodonio dos Santos, Fernando Henrique Cardoso, and Enzo Faletto.

most successful attempt to bring the concept of development in line with the multiple expectations of contemporary societies.

The idea of "human development" was originally proposed by the Pakistani economist Mahbub ul Haq and eventually led to the creation of the human development index (HDI), which serves as the basis for annual reports produced by the UNDP. Ul Haq described the notion of development in the following way:

> The basic purpose of development is to enlarge people's choices. In principle, these choices can be infinite and can change over time. People often value achievements that do not show up at all, or not immediately, in income or growth figures: greater access to knowledge, better nutrition and health services, more secure livelihoods, security against crime and physical violence, satisfying leisure hours, political and cultural freedoms and sense of participation in community activities. The objective of development is to create an enabling environment for people to enjoy long, healthy and creative lives. (UNDP, 2004 "What is HD")[4]

Another valuable definition of the concept is given by Howkins and Valantin (1997) who look at factors such as education, literacy, health, and economic growth but also include politics and technology in their evaluation. Howkins and Valantin (1997:9-10) define five indicators of socio-economic development, which they refer to as the five priorities. First, literacy, education, and the acquisition of professional training and skills should be freely accessible to all members of society. Second, health and the overall physical well-being of the population are also indicative of development. The third factor is economic welfare as indicated by "high levels of employment, high incomes per capita, and increased gross national product, with appropriate corrections for environmental protection and for income equity". The fourth indicator, identified by the authors

[4] In keeping with ul Haq's ideas, the HDI focuses on three crucial aspects: a long and healthy life, access to knowledge, and a decent standard of living. The index includes statistics on life expectancy at birth; adult literacy rate as well as the combined gross enrolment ratio for primary, secondary, and tertiary schools; and GDP per capita in purchasing power parity (PPP) measured in US dollars (UNDP, 2004 "What is HD").

as "choice, democracy, and participation", refers to people's "participation in social and economic affairs, with fair economic rewards, the availability of reasonable choice, and participation in the democratic process". Technology figures as the fifth indicator of socio-economic development on Howkins and Valantin's list and evaluates the way in which a country's "capacity to develop technological innovations and to make technological choices" contributes to its overall development.

Authors such as E. S. Simpson have also emphasized elimination of poverty as an essential goal of development. Simpson (1994:11) aptly points out that the "concept of development when viewed from inside the Developing World has often been neglected. The poor peasant of Peru or the slum-dweller of Calcutta would no doubt, if asked, conceive of development as the amelioration of his dire poverty". Indeed, poverty has been frequently deemed as the most apparent and most persistent feature of Third World countries, and reducing extreme poverty by half by the year 2015 is the very first of the eight Millennium Development Goals. So far, however, Latin American countries have shown minimal improvement in this area (UN DESA, 2004), and "[p]overty and inequality remain the region's primary development challenges" (CIDA, 2004).

The definition of development I have decided to adopt for the purpose of my own research is a combination of the concepts and definitions outlined by Cardoso, ul Haq, Howkins and Valantin, and Simpson. I view development as an overall improvement in the standard of living and the quality of life that would affect all groups and classes making up a country's population. A nation can be called developed when the basic needs of the majority of its citizens are satisfied and when all members of society have the freedom and equal opportunities to develop their human potential in all spheres of life. Hence, the process of

development should be integral and focused on improving various aspects of human life. In this thesis, I will focus on Peru's development primarily from the perspectives of economic growth, education, and politics.

1.2.2. Information and communication technologies (ICTs)

Especially during the last two decades, information and communication technologies (ICTs) have become closely tied with the concept of development. Generally, they tend to be associated with such things as telephones (fixed lines and mobiles), computers (hardware and software), and the Internet. A useful definition of ICTs is proposed by Low (2000:308) who describes them as "all the kinds of electronic systems used for broadcasting, telecommunications, and computer-mediated communications". Yet the recent and extremely rapid evolution of these technologies is often attributed not only to their improved quality and effectiveness but also to their convergence. Dearnley and Feather (2001:25) point out that it is the convergence of "information storage and processing devices [...] and devices for the communication of information" that marks "a critical moment in the history of both". Castells (2000:29) similarly defines information technologies as "the *converging set* of technologies in micro-electronics, computing (machines and software), telecommunications/ broadcasting, and opto-electronics". For the purpose of my research, I chose to focus primarily on the Internet and related computer technologies since these ICTs have been key to the Information Age and have had the strongest impact. They also illustrate perfectly the phenomenon of convergence.[5]

---

[5] As one source explains, technological convergence refers to "the modern presence of a vast array of different types of technology to perform similar tasks. For example, in today's society one can communicate with a friend via mail, online chatting, cellphones, e-mail, and many other forms of modern technology. Though the forms of technology are

The origin of the Internet[6] can be traced to the year 1965 when the Advanced Research Projects Agency (ARPA), created by the US Department of Defense, began work on the first computer network meant primarily to strengthen the country's military defenses in case of a nuclear attack by the USSR. Already in 1969,

> researchers at four US universities created the first network, the ARPANET, by connecting the universities of Stanford, Utah, and California at Los Angeles and at Santa Barbara. From then on, the network began to grow literally by the minute. In 1973, the ARPANET went international by connecting the American network with University College in London, United Kingdom, and the Royal Establishment in Norway. In 1979, three graduate students in North Carolina established the first USENET newsgroup and opened the net to the ordinary public. (Rajaee, 2000:72)

Thus, the early forms of the Internet began to emerge from military, scientific, and academic circles into the public arena.

Another major breakthrough in the history of the Internet occurred in 1989 when Tim Berners-Lee, working for CERN in Geneva, invented the World Wide Web. Rajaee (2000:73) hails this invention as "the foundation of the global information society" and Griffiths (2002) describes its workings in the following way:

> The World Wide Web is a network of sites that can be searched and retrieved by a special protocol known as a Hypertext Transfer protocol (HTTP). The protocol simplified the writing of addresses and automatically searched the internet for the address indicated and automatically called up the document for viewing.

---

all very different, they all essentially provide the same basic service: person-to-person communication. [...] The convergence can also concern the underlying communication infrastructure" (Wikipedia, 2005 "Convergence"). When referring to the different kinds of media, convergence "occurs when multiple products come together to form one product with the advantages of all of them" (Wikipedia, 2005 "Convergence").

[6] For a more detailed history of the Internet, see Griffiths (2002).

It was basically the World Wide Web that made searching for and retrieving documents on the Internet easy. Two years after its invention, the Web was made available for general public use, and it did not take long for the Internet and the Web to gradually spread into nearly every area of our lives.[7] Nowadays, we use the Net to communicate with others (over e-mail or IP telephony), conduct business, search for all kinds of information, listen to radio programs, enjoy online television broadcasts, and accomplish a seemingly infinite number of other tasks.

Scholars of technology and development generally agree that ICTs such as the Internet certainly have the potential to aid developing countries in improving their socio-economic standing. However, it is not enough to simply take the ICTs from the context of the industrialized world and drop them into that of the developing world. In the report by Credé and Mansell (1998), which summarizes the results of an extensive study on ICTs in the developing world conducted by the UN Commission on Science and Technology, there are several conclusions worth noting. The report states that although "ICTs can be truly transformative [...] [they] do not operate in isolation. The benefits and risks depend on the social, economic, and organizational context in which the ICTs are applied" (Credé and Mansell, 1998:xi). Hence, if these technologies are to satisfy the development needs of the majority of the population, their introduction in developing countries must be accompanied by social, economic, and political

[7] Tim Berners-Lee described the difference between the Internet (the Net) and the World Wide Web (the Web) in the following way: "The Web is an abstract (imaginary) space of information. On the Net, you find computers – on the Web, you find documents, sounds, videos... information. On the Net, the connections are cables between computers; on the Web, connections are hypertext links. The Web exists because of programs which communicate between computers on the Net. The Web could not be without the Net. The Web made the Net useful because people are really interested in information [...] and don't really want to have to know about computers and cables." (Griffiths, 2002)

reforms which support their implementation. In addition, the effectiveness of ICTs as tools for development depends to a large extent on careful planning preceding their implementation. It is very important for developing countries to conduct a thorough assessment of their ICTs inventory (infrastructure, equipment, human resources, finances, etc.). Only then will they be able to identify gaps, set their development priorities, and formulate their own agendas and policies. The strategies for acquiring and using ICTs must address the unique needs and be appropriate to the local context of each country. An adequate infrastructure is also of crucial importance.

> If developing countries have no communication infrastructure or it is unreliable, limited in capacity, or simply too expensive to use, they will be unable to exploit the new opportunities these networks provide. [...] This infrastructure includes the communication network, but it may also include computer hardware and software, as well as information content. (Credé and Mansell, 1998:19)

Finally, the report lists the following factors as "the key considerations in the design and implementation of an ICT strategy" (Credé and Mansell, 1998:43):

> producing and using ICTs for social and economic advantage, developing the human resources to effectively implement the strategy, managing S&T [science and technology] innovation in the ICT sector for sustainable development, improving access to ICT networks, promoting and financing investment in ICTs, creating and accessing S&T knowledge, and monitoring and influencing the international rules of the game.

Another frequently mentioned point is the issue of access, since "[t]he potential impact of ICTs rests on the factors facilitating or impeding their accessibility and use" (Morales-Gómez and Melesse, 1998:5). At the same time, access to ICTs is frequently determined by the broader socio-economic context. As Morales-Gómez and Melesse (1998:5) note, "issues surrounding access to ICTs are by and large a function of the broader equity and wealth distribution

practices that determine the state of social exclusion within a given social formation". Heeks (1999:7) expands this point:

> Accessing ICT-carried information requires a lot of overt resources including a telecommunications infrastructure to provide network access, an electrical infrastructure to make the ICTs work, a skills infrastructure to keep all the technology working, money to buy or access the ICTs, usage skills to use the ICTs, and literacy skills to read the content. The poor simply do not have these resources.

Equally important is the issue of ownership and control of ICTs as "[i]nformation and the means for its dissemination represent power" (Morales-Gómez and Melesse, 1998:7). Indeed, the link between information, knowledge, and power is a recurrent theme in the literature on ICTs and development. For instance, Credé and Mansell (1998:11) note that "[a]lthough ICTs offer new techniques for acquiring digital information, this information is of little use in developing countries if it cannot be transformed into knowledge relevant to development". Heeks (1999:8-9) elaborates that in order for the data to be useful to a particular group of people, it must be appropriate to their socio-cultural context (source proximity), they must trust its communication channel as well as its source, they must possess adequate knowledge to assess and interpret the data, and they must feel sufficient confidence and security when using the new communication channels. Otherwise, the information gained through the ICTs will be useless to its recipients and will not lead to the desired empowerment. In fact, Heeks (1999:10-11, 18) accuses the web of "mainly provid[ing] the information-thirsty poor with a flood of 'noise': digitized, Westernized irrelevance". This leads him to emphasize the importance of "the poor as information sources" and to conclude that "[t]he poor will only reap the fullest benefits of ICTs when they own and control both the technology and its related know-how".

There are several points which specialists insist should be mentioned in a summary of the criteria for effective implementation and use of ICTs in the Third World. After the initial assessment of their technological inventory, developing nations need to choose carefully the ICTs that will help them achieve specific development goals. New technologies should be acquired and implemented selectively and should be a means to development rather than an end. They should be incorporated in a way and at a pace appropriate to the context of a particular developing nation so that the local population does not feel as if the technology is being imposed upon them. The newly implemented ICTs must be physically accessible, affordable, and appropriate to local conditions and users' needs. Also, people must understand how the ICTs can be used, and the access to these technologies should be open to all, regardless of gender, race, or other socio-cultural factors. Furthermore, ICTs should be implemented in ways that foster people's trust in using them and do not create new burdens on users' lives. It is equally important for these technologies to offer locally relevant content, particularly where language and local context are concerned. Other factors that must be present are an appropriate legal and regulatory framework, a local economic environment, a national economic policy, and the political will and ongoing commitment on part of the government all targeted at supporting widespread use of ICTs.[8] Scholars like Stover (1984) have further urged developing nations to use these imported technologies as a base for fostering indigenous technology initiatives and thus to build up their technological self-reliance and local capacities. The importance of regional cooperation in

[8] All of these points are also mentioned in the "Real Access" section of the Bridges.org website (2003/2004).

implementing new technologies and in developing research in this area should not be overlooked, either.[9]

1.2.3. The Information Age

Already in the 1980s, the term "information society" had been used to denote "socioeconomic systems that exhibit high employment of information-related occupations and wide diffusion of information technologies" (Katz, 1988:xiii). However, it was not until the 1990s that the phrase "Information Age" became firmly embedded in everyday language and the information society turned into the object of extensive study and detailed analysis.

Manuel Castells (2000, 2001) has been perhaps the most prolific writer on issues pertaining to the Information Age. He attributes the rapid proliferation of ICTs in the last quarter of the 20th century to a number of factors which he summarizes as an "interface between macro-research programs and large markets developed by the state, on the one hand, and decentralized innovation stimulated by a culture of technological creativity and role models of fast personal success, on the other hand" (Castells, 2000:69). As Hoogvelt (2001:126) writes, for Castells the dominant characteristic of the Information Age is found in

> the logic of informationalism, a new technological paradigm based on information technologies. Informationalism not only intensifies the competition between capitalists in the economic life, but also shapes the

[9] Morales-Gómez and Melesse (1998:9) summarize the core issues with respect to ICTs and development in the form of questions each developing country should ask itself when implementing ICTs: "what are [...] the most appropriate technologies for the socio-economic and cultural conditions of developing countries? who has control over the introduction, operation and long-term sustainability of these technologies in a given social setting? through what means and with what degree of success do the transfer and adoption processes take place? who has access to these technologies and how are issues of equity, equality and quality of access managed? who determines the relevance and quality of content and how? how does the role of these technologies balance out in the broader context of economic, human and social development priorities of the recipient societies? and where are the limits for blending developmental, business and political agendas in the transfer of these technologies?"

> overall social structure of society, for it creates perpetually changing *networks* of social interaction [...], producing new social relationships and social norms in contrast to previous times, when the structure of society was more or less fixed in space and time as social 'order'.

The new economy which emerges out of this paradigm is "informational, global, and networked" (Castells, 2000:77).

> Whereas, in the old economy, land, labour and capital were the only three 'generic' factors of production, in the 'new economy', the critical assets are expertise, creativity, and 'intelligence' or 'information'. Intelligence embedded in software and technology across a wide range of products has become more important than capital, materials or labour. (Hoogvelt, 2001:110)

However, it is not only "the centrality of knowledge and information, but the application of such knowledge and information to knowledge generation and information processing/communication devices, in a cumulative feedback loop between innovation and the uses of innovation" (Castells, 2000:31) that makes the information revolution we are currently experiencing different from those caused by other technological inventions.

Clearly, ICTs are fundamental to the Information Age. Because of inventions in computer technology, time and space are compressed, and capital flow occurs instantaneously. The nature of enterprise, work, and employment is constantly changing and is increasingly characterized by flexibility. Many, if not most, of these changes can be attributed to the powers of the Internet whose effects stretch far beyond the field of economy. Castells (2001:1) uses the following analogy to convey the essential function the Net has assumed:

> The Internet is the fabric of our lives. If information technology is the present-day equivalent of electricity in the industrial era, in our age the Internet could be likened to both the electrical grid and the electric engine because of its ability to distribute the power of information throughout the entire realm of human activity. Furthermore, as new technologies of energy generation and distribution made possible the factory and the large corporation as the organizational foundations of industrial society,

> the Internet is the technological basis for the organizational form of the Information Age: the network.

The quotation also brings us to the concept which lies at the heart of Castells' vision of the information society – the network:

> Networks are open structures, able to expand without limits, integrating new nodes as long as they are able to communicate within the network, namely as long as they share the same communication codes (for example, values or performance goals). A network-based social structure is a highly dynamic, open system, susceptible to innovating without threatening its balance. Networks are appropriate instruments for a capitalist economy based on innovation, globalization, and decentralized concentration; for work, workers, and firms based on flexibility and adaptability; for a culture of endless deconstruction and reconstruction; for a polity geared toward the instant processing of new values and public moods; and for a social organization aiming at the supersession of space and the annihilation of time. (Castells, 2000:501-02)

The implications of the Information Age for developing nations are many. As Credé and Mansell (1998:ix) point out, the present situation is such that "[a]lthough the costs of using ICTs to build national information infrastructures to contribute to innovative knowledge societies are high, the costs of not doing so are likely to be much higher". With respect to the Internet in particular, Castells (2001:245) also warns that "[t]he centrality of the Internet in many areas of social, economic, and political activity is tantamount to marginality for those without, or with only limited, access to the Internet, as well as for those unable to use it effectively". He further acknowledges the potential of these technologies to contribute to the existing socio-economic inequalities in our societies (Castells, 2000:33). This negative potential certainly exists, and according to Ramonet (2004),

> [t]wo figures give a sense of the inequality: 91% of the world's users of the internet are drawn from only 19% of the world's population. The digital gap does as much to accentuate and aggravate the North-South divide as the traditional inequality between rich and poor - 20% of the population of the rich countries own 85% of the world's wealth. If nothing

> is done, cyber technologies will leave the inhabitants of the least advanced countries outside, especially in sub-Saharan Africa, where scarcely 1% of people have access, and those are mostly men.

Hence, many African, Asian, and Latin American nations rightly fear being left out and deprived of the benefits of the information revolution. In the developing world, however, vast portions of the population have to struggle to satisfy their basic needs; acquiring and learning how to use modern technologies are oftentimes farther down on their list of priorities. On the other hand, Third World countries cannot ignore the extraordinarily rapid pace of technological progress. This situation creates new pressures on them to modernize and join "the network"; otherwise, they risk being left out of the globalized economy, remaining on the margins of the global information society.

1.2.4: Background information on Latin America and Peru

Latin American countries[10] have a long, varied, and often turbulent history. At some point in the past, they were all either Spanish or Portuguese colonies and in most cases achieved their independence in the early 19th century. However, generally speaking, in Latin America independence did not bring about prosperity. Even today, the majority of the countries in the region are classified as developing nations. The current political and socio-economic situation of Latin America can be summarized in the following way:

> The past decade has brought dramatic change to the countries of Latin America and the Caribbean. Most have democratically elected governments. [...] Almost all countries have moved from state-run,

[10] My research has focused largely on the Spanish-speaking countries that are part of South, Central, and North America as well as the Caribbean. The one exception is Brazil which is also part of the region and which is very important economically, politically, and culturally but where Portuguese is the official language. Hence, whenever I use the term "Latin America" in my dissertation, I am referring primarily to the Spanish-speaking countries of the region and Brazil.

> protectionist economies to a more liberalized, free-market approach. The region is tremendously diverse, encompassing some of the world's most destitute nations, such as Haiti and some of the world's industrial powers, such as Brazil.
>
> Despite the region's recent progress, poverty and inequality remain the primary development challenges. The greatest income gap in the world is found in the Americas: the bottom 20 percent of the population earns 5 percent of the national income, while the top 20 percent earns 50 percent. Over 225 million people live in poverty, with children, women, rural populations, and indigenous and black communities most affected. Unequal access to health care, education, and productive assets like land and capital, perpetuate this imbalance. The region also experiences a high level of volatility: political instability, rising crime and violence, environmental deterioration, climatic variability, and economic fluctuations all worsen poverty, inequity, and social tensions. (CIDA, 2005)[11]

Far from being an exception, Peru is rather a typical example of the countries in the region, and I chose to focus on it for several reasons. A discussion of the state of ICTs in the entire Latin American region is clearly beyond the scope of my research at this point. At the same time, Peru is representative of this part of the world from a social, economic, and political perspective. It is a country that throughout its history has struggled with many problems characteristic of Latin America, that has undergone great political changes in recent years, and that is currently starting to implement many noteworthy reforms and initiatives in the field of telecommunications and computer technology. Peru is also a typical developing country facing many of the problems commonly associated with the Third World, such as poverty, corruption, political and economic instability, human rights abuses, and overall a very low standard of living.

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[11] An excellent and far more detailed description of the region can be found in Sections 1 and 2 of the document "Closing the Gap: A Strategy for CIDA in the Americas" (2004). Another valuable source of information on economic development in Latin America is Patrice Franko's work, The Puzzle of Latin American Economic Development (2003).

FIGURE 1.1
A map of Peru

Source: <http://peru.gotolatin.com/>.

Peru boasts a history that spans thousands of years, with the Incas being the last in a long line of great civilizations that originated on what is nowadays Peruvian territory. In the year 1533 the immense Inca empire, conquered by the Spanish under the leadership of Francisco Pizarro, fell, and its territories became yet another Spanish colony. In 1535, Peru's current capital Lima was established as the capital of the Viceroyalty of Peru, which covered all of the South American territories belonging to the Spanish Crown. In many ways Peru became the center of colonial rule on the continent, and it was not until 1821 that it declared its independence from Spain. However, national sovereignty did not bring about the country's political or economic stability. Even today, more than

180 years after proclaiming its independence, Peru still struggles with corrupt governments, rising debt, and widespread poverty.

Peru's territory is the third largest on the South American continent. Geographically, the country is divided into three main zones: the coastal region along the Pacific Ocean in the West, the Andes Mountains in the center, and the jungle region in the East and the Northern Amazon Basin. Politically, Peru consists of 25 administrative regions (24 departments and one constitutional province).[12] According to the most recent estimates, Peru's population reached 27,544,305 in July 2004 (CIA, 2005), with 72.3% of its inhabitants living in urban centers and 27.7% in rural areas (RCP, 2003). The capital city Lima is home to nearly one third of the country's entire population and is the center of the country's economic and political activity. With regard to Peru's ethnic makeup, indigenous (Amerindian) groups account for 45% of the total population, the *mestizos* (mixed Amerindian and white) for 37%, those classified as white for 15%, and the Afro-Peruvians and other racial minorities make up the remaining 3% (CIA, 2005). The two official languages are Spanish and Quechua, but Aymara and many indigenous languages of the Amazon region are widely spoken in some parts of the country, too.

For a number of reasons, Peru has often been likened to a "beggar sitting on a bench of gold".[13] Given its strategic location and rich natural resources, it is potentially wealthy. In reality, however, it is one of the poorest countries in Latin America.

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[12] The constitutional province is Callao and the 24 departments are as follows: Amazonas, Ancash, Apurímac, Arequipa, Ayacucho, Cajamarca, Cusco, Huancavelica, Huánuco, Ica, Junín, La Libertad, Lambayeque, Lima, Loreto, Madre de Dios, Moquegua, Pasco, Piura, Puno, San Martín, Tacna, Tumbes, and Ucayali.

[13] The geographer Antonio Raimondi is credited with coining this popular phrase. See Peru Support Group (2004).

> Despite its gold, copper and zinc mines, despite huge natural gas deposits and oilfields, more than half its population earns less than US$ 2 [...] a day. More than 10% of the work force is unemployed, but a much higher percentage is underemployed, works in the informal sector or are subsistence farmers. Control of the economy is largely in the hands of the state and a small entrepreneurial class based in Lima. (Peru Support Group, 2004)

Poverty reduction by meeting basic human needs and improving the productive capacity of the poor are among the top challenges that the country is presently facing (CIDA, 2004). The following statistics illustrate the gravity of the problem.

> Currently around 54.8% of Peruvians live in conditions of poverty. This figure is up from 48.4% at the end of 2000. Those living in extreme poverty constitute 24.4% of the population compared with 15% in 2000. In some rural areas this figure is much higher. In the department of Huancavelica 88% of the population live in poverty, and as much as 74% in extreme poverty. Some sections of society – such as women, children and indigenous peoples – are disproportionally represented among the poor. (Peru Support Group, 2004)[14]

An additional factor contributing to the widespread poverty is the extremely uneven income distribution in Peru. According to the most recent statistics, the poorest 20% of the Peruvian population obtains only 6% of the total national income, while the richest 20% of the population obtains 48% (RCP, 2003)[15]. Given the fact that the vast majority of Peru's wealthy population resides and does business in Lima, it is not surprising that the rural areas remain poor and neglected.

In the past, the state has failed to address the problems of social and economic inequality with which Peru has struggled for decades. Following a long

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[14] These are the official numbers based on a survey from the year 2001 and reported by the Instituto Nacional de Estadística e Informática (INEI) (trans. National Institute of Statistics and Informatics), Peru's governmental statistics agency. Other sources set the number of Peruvians living below the poverty line at 62.7% of the entire population (RCP, 2003).

[15] These statistics were collected in the year 2000 and published in 2002 in the latest report on "Human Development in Peru".

period of military rule, Peru became a democratic republic again in the 1980s and is presently headed by President Alejandro Toledo. The current government has recently embarked on an ambitious process of state restructuring aimed at achieving greater national integration and decentralizing the political and economic activities that until now have been heavily concentrated in Lima. The reforms mark the government's recognition of the fact that in order to tackle problems such as poverty and inequality effectively, more attention has to be paid to Peru's rural areas, and political and economic activity needs to be more uniformly distributed throughout the entire country. In November 2002, voters in each one of the 25 administrative regions elected new political leaders endowed with much greater authority over their territory than before (CIA, 2005; RCP, 2003). However, the effectiveness of these decentralization measures remains to be seen.

1.2.5. Development of ICTs in Latin America and Peru

The introduction of ICTs in Latin America has been actively promoted for quite some time now. Most of the countries in the region still fall into the category of developing nations and tend to have high expectations with respect to modern technologies, especially the Internet. By implementing computer technology and going online, they hope to speed up the pace of their economic, social, and political development. In Latin America, the history of the Internet goes back to the mid-1980s when some of the countries in the region began experimenting with the first network connections.

> One of the fast countries in the region to experiment with the Internet was Mexico, where efforts to connect networks at the National Autonomous University in Mexico City (UNAM) and the private Technological Institute of Monterrey (ITESM or Monterrey Tec) began over a decade ago. In 1985, the computer science department at the University of Chile began

> experimenting with UUCP (UNIX-to-UNIX network news), and in 1987 Chile became the first Latin American nation, followed by Argentina, to enter the UUCP network with access to e-mail and USENET. (Belejack, 1996)

Currently, Chile, Costa Rica, and Uruguay are the most developed in terms of ICTs.[16] Many other countries in the region have only recently begun to take concrete steps towards increased introduction of ICTs in the various sectors of society. The table below reflects the state of ICTs in Latin America, with the United States and Canada included for comparison.

TABLE 1.1
Selected ICT statistics for Latin America, Canada, and the United States per 100 inhabitants (2002)

Source: UN Statistics Division, <http://unstats.un.org/unsd/mi/mi_source_xrxx.asp?source_code=36>.

Country	Number of telephone lines and cellular subscribers	Number of personal computers	Number of Internet users
Argentina	39.64	8.20	11.20
Bolivia	17.22	2.28	3.24
Brazil	42.38	7.48	8.22
Chile	65.86	11.93	23.75
Colombia	28.56	4.93	4.62
Costa Rica	36.15	19.72	19.31
Cuba	5.19 (2001)	3.18	1.07 (2001)
Dominican Republic	31.71	not available	3.64
Ecuador	23.08	3.11	4.16
El Salvador	24.10	2.52	4.65
Guatemala	20.20	1.44	3.33
Honduras	9.69	1.36	2.52
Mexico	40.12	8.20	9.85
Nicaragua	6.97	2.79	1.68
Panama	31.15	3.83	4.14 (2001)

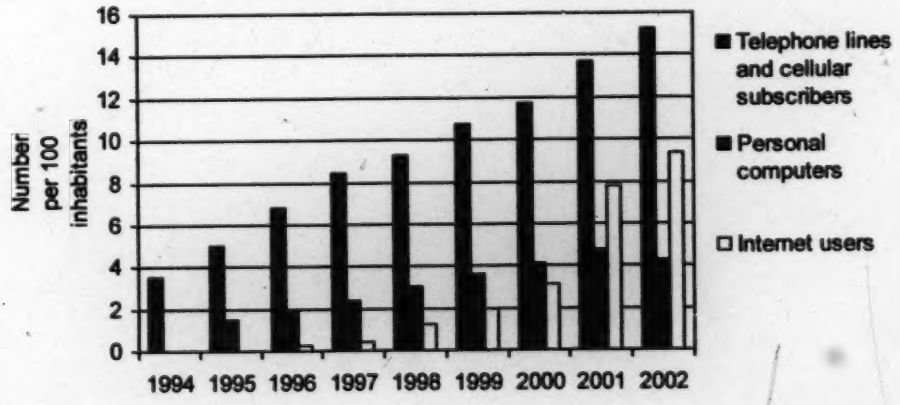
[16] For exact statistics on these countries, consult Table 1.1.

Paraguay	33.56	3.46	1.73
Peru	**15.23**	**4.30**	**9.35**
Uruguay	47.22	11.01 (2001)	11.90 (2001)
Venezuela	36.92	6.09	5.06
Canada	113.40	65.89	55.14
United States	101.26	48.70	51.28

Comparing the current state of ICTs in Peru with statistics from Canada, the United States, or even some of the more developed Latin American countries, the gap traditionally referred to as the digital divide becomes obvious. However, as the graph in Figure 1.2 illustrates, ICTs in Peru have been spreading at a steady pace for the past decade. Their increased implementation has also been supported by radical reforms of the telecommunications sector and by several important initiatives aimed at furthering the introduction of ICTs in the various sectors of the society and in the different regions of the country.

FIGURE 1.2
Growth of selected ICTs in Peru (1994-2002)

Source: UN Statistics Division,
<http://unstats.un.org/unsd/mi/mi_source_xnxx.asp?source_code=36>.



Thielemann (2003:29) observes that "Peru's national telecommunications network was one of the most underdeveloped systems in South America by the mid-1980s". Even in 1993, the mere installation of a telephone line required a waiting period of 18 months and a connection fee of US$ 1,500 (RCP, 2003).[17] However, already two years earlier, Peru's telecommunications sector began to undergo radical market liberalization reforms. In 1991, the new Telecommunications Act (legislative decree 702) was passed, opening up the state-owned sector to free competition and private investment.[18] The privatization of the telecommunications sector gradually brought about many improvements with regard to service, coverage, and the cost of telecommunications in Peru. The new legislation also created the Organismo Supervisor de Inversión Privada en Telecomunicaciones (OSIPTEL),[19] a regulative agency which started its operations in 1993 and whose "main objectives are to promote the development of telecommunications services throughout the whole country, to ensure that qualitative improvements of these services are undertaken, and to guarantee a free market environment" (Thielemann, 2003:59). A core subdivision of OSIPTEL is the Fondo de Inversión en Telecomunicaciones (FITEL),[20] an agency focused on planning, financing, and implementing telecommunications development projects in Peru's rural areas.

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[17] By 2001, the waiting period was reduced to 15 days and the connection fee to US$ 156.
[18] An important milestone was the sale of Empresa Nacional de Telecomunicaciones (ENTEL) and Compañía Peruana de Teléfonos (CPT), Peru's two state-owned telecommunication companies, to Telefónica de España, a private Spanish telecommunication company, in 1994.
[19] Trans. Supervisory Organism of Private Investment in Telecommunications.
[20] Trans. Fund for Investment in Telecommunications.

Yet despite the continued spread of ICTs and all the positive developments in the Peruvian telecommunications sector, the numbers in Figure 1.2 tend to conceal the internal gap in the access to ICTs among different social classes as well as among the inhabitants of the different regions of the country. To illustrate, the table below indicates the percentage of Peruvians in the different socio-economic classes[21] with ownership of the various types of ICTs.

TABLE 1.2
Ownership of ICTs by socio-economic class (December 2001)
Source: RCP, 2003.[22]

Type of ICT	Classes A and B (upper)	Class C (middle)	Classes D and E (lower)
Landline telephone	88%	50%	19%
Cellular telephone	54%	23%	5%
Cable television	66%	22%	4%
Computer	53%	8%	1%
Internet (home access)	29%	1%	0%
Television	100%	99%	91%

In addition to the socio-economic divide where access to ICTs is concerned, there also exists a regional divide. Given the fact that most of the economic and political activity has traditionally been concentrated in Lima, the development of telecommunications in the past was largely focused on the coastal area, particularly the capital, and neglected the rural areas in the mountain region and in the jungle. As the figure below illustrates, four years ago numerous rural districts in the interior of the country were still lacking the basic telecommunications infrastructure.

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[21] According to Peruvian conventions, socio-economic classes are denoted by the letters A, B, C, D, and E, with the A-class being the wealthiest and the E-class being the poorest.
[22] The survey was originally carried out by the Apoyo Opinión y Mercado research group.

FIGURE 1.3
Areas without telephone access in Peru marked in gray (2001)
Source: San Román, 2002:24.

FITEL has been striving to address such regional inequalities through a number of projects under the Programa de Proyectos Rurales (PPR).[23]

> During the first phase [of the PPR], Northern Border Project, the FITEL funds were used to subsidize the provision of public payphones to 213 rural villages in Peru's northern jungle region. During the second phase the South, Middle-South, and North Tropical Forest Projects subsidized private sector provision of public payphones to 1,937 small villages in South, South Central and Northern areas. The FITEL II program also subsidized private sector companies to install community telecenters in 236 rural district capitals by 2002. (OSIPTEL, 2005 "Rural Telecommunications")

In December 2004, OSIPTEL has announced its most recent project, Proyecto de Expansión Celular en Zonas Rurales,[24] to be carried out through FITEL over the next two years. Given the geographical obstacles (mountain ranges, dense tropical forests) in accessing some of Peru's areas, fixed telecommunications

[23] Trans. Rural Projects Program.
[24] Trans. Project of Cellular Expansion in Rural Zones.

infrastructure can be extremely difficult and costly to install and maintain. Mobile telephone services present a viable alternative to fixed telephone lines. Indeed, in 2004 the number of cellular mobile subscribers reached 14.74 per 100 inhabitants, amounting to more than double the number of fixed telephone lines, reported as 7.20 per 100 inhabitants (OSIPTEL, 2005 "Indicadores"). OSIPTEL's latest project aims to install and service 81 new cellular stations distributed throughout the Peru's interior. Each of the stations would provide cellular coverage to at least 7,000 inhabitants, adding up to a total of 638,000 inhabitants of rural areas[25] who did not have access to cellular telecommunication services before (OSIPTEL, 2005 "Proyecto").

With respect to computer technology in Peru, its growth over the last decade has also been steady, and it is the Internet that has shown the most rapid and remarkable development in recent years. Thielemann (2003:122-24) identifies four distinct phases in the development of the Internet in Peru, summarized in the table below.

TABLE 1.3
Development of the Internet in Peru
Source: Thielemann, 2003:122-24.

Phase	Description
I: mid 1980s – 1990	attempts at establishing larger computer networks begin; many independent projects are started but prove largely unsuccessful
II: 1991 – 1994	Red Científica Peruana (RCP)[26] emerges in 1991; first Internet connections are established; the scope of RCP's activities increases and the number of Internet users grows rapidly; government starts to implement radical reforms of the telecommunications sector

[25] This number amounts to 8.35% of Peru's total rural population (OSIPTEL, 2005 "Proyecto").
[26] Trans. Peruvian Scientific Network.

III: 1995 – 1998	privatization of the telecommunications sector continues; *cabinas públicas*[27] spread rapidly and become the most popular way for Peruvians to access the Internet; the number of Internet users continues to grow at an extremely fast pace
IV: 1998 – today	liberalization of the telecommunications market is completed in 1998; *cabinas públicas* spread throughout the whole country; the variety of services available to Internet users continues to increase; the number of Internet users continues to grow

The very first connections to the Internet were established by RCP without any government support or financing – a fact that is often pointed out as setting the introduction of the Internet in Peru apart from that of other developing countries (Thielemann, 2003:v, 40). RCP was founded as "a non-profit, user-financed consortium of individual, academic, nongovernmental, business and public sector members [...] with seed money from the United Nations Development Program" (Belejack, 1996). The consortium is further credited with the implementation of the very first *cabinas públicas* and with making the Internet accessible to the general public from the very beginning.

In 2003, the number of Internet users in Peru was estimated to be 10.39 per 100 inhabitants – the sixth highest in all of Latin America (ITU, 2004). In reality, the exact number is very difficult to establish because most Peruvians access the Internet from public places such as the *cabinas públicas*. Another statistical indicator frequently quoted as a good way to measure the spread and popularity of the Internet in a given country is the number of registered Internet domains. In the case of Peru, in 1996 there were only 67 registered Peruvian domains, but by the year 2002 the number had risen to 8,623. Out of these,

[27] The phenomenon of the *cabinas públicas*, a term usually translated as Internet cafés/public booths, is described in greater detail in Chapter 2.

83.3% belonged to businesses, 8.7% to organizations, and 4.4% to educational facilities (RCP, 2003).

Nowadays, the Peruvian government and its agencies have also become an active promoter of an increased introduction of ICTs and the Internet in particular into the economic, social, and political spheres of life. Despite the fact that the state of ICTs in Peru still leaves a lot to be desired, the country's leadership continues its efforts to strengthen the technological base and to democratize access to modern technologies. Ongoing projects of public agencies such as OSIPTEL and FITEL aim to bring ICTs to the most remote areas of the country as well as to improve Peru's overall productivity with the help of these technologies. The government of President Toledo has also embarked on the ambitious Plan Huascarán[28] that promotes the introduction of computer technology and Internet access in schools located in the country's poorer regions. Another significant development in the history of ICTs in Peru is the establishment of "electronic government" and the launch of the very first state portal on May 22nd, 2001. These and other initiatives will be described in detail in the corresponding chapters on ICTs and Peruvian economy, education, and government.

Presently, developing countries do not have much choice with respect to ICTs. They must find creative ways to adopt the newly emerging technologies to their benefit. If they fail to do so, they will only fall further behind the developed nations. The biggest challenge facing countries such as Peru is how to incorporate these new technologies appropriately into their social, cultural, economic, and political context so as to best suit their own needs and assure the

[28] Trans. Huascarán Plan. The plan is discussed in detail in Chapter 3.

sustainability of these technologies. Therefore, further research in the area of ICTs and development is of crucial importance.

1.3. Research methodology and organization

In conducting my study, I have relied mainly on literature in print and electronic format. Government documents, regional studies and reports, statistics collected by national and international organizations, as well as media releases, were particularly valuable sources of information and form the material basis of the study. All the printed sources necessary to complete my project were accessible either online or through a library. My research did not include any personally conducted surveys or interviews. Because of the limited scope of an M.A. thesis, I did not travel to Latin America personally while conducting my research. In the period 1999-2003, I spent nearly four years in Peru and was able to collect plenty of first-hand experience. I have had the opportunity to familiarize myself thoroughly with Peruvian culture and everyday life as well as to visit some of the poorest regions in the country.

The thesis is divided into five chapters. Chapter 1 is meant to give the reader a general introduction to some of the key questions underlying my research. In Chapter 2, I look closer at the potential impact of ICTs on Peruvian businesses and economy. Chapter 3 is devoted to the role of ICTs in another highly important area – Peruvian education. The focus of Chapter 4 is on ICTs and political change, and in particular the notion of e-government in the Peruvian context. In Chapter 5, I draw together the main results of my research, and based on them, I attempt to make some projections for possible future developments in the field of ICTs in the various sectors of Peruvian society.

Chapter 2
ICTs and Economic Growth in Peru

2.1. Introduction

Economic growth had been equated with development for many decades. In the recent past, however, the notion of development has evolved into a much more integral concept which now also encompasses different aspects of social and human development. Yet, the importance of a nation's material well-being should not be underestimated. Indeed, steady economic growth can provide a healthy basis for development, especially considering the fact that many of the social and political problems of Third World nations are, in one way or another, connected to the lack of economic well-being and stability. The kind of economic growth that would truly foster development would be one "that benefits all sectors of the population by removing barriers, building up capacity, and creating opportunities so that poor people can participate in the economy" (CIDA, 2005). This kind of equitable growth would encompass "governance – particularly reforms to support social, political, and economic inclusion; economic productivity – including economic policy and private sector development; [and] basic human needs – especially primary education [...] and basic health care" (CIDA, 2005).

In all of these areas, ICTs have the potential to help bring about positive change and contribute towards the kind of equitable growth described above. Besides enabling communication, ICTs make accessible information, which has become an essential ingredient to success in today's globalized world,

particularly where business is concerned. This chapter will be devoted to the role of ICTs in the process of economic growth, with a focus on the different ways in which Peru is using computer technology and the Internet in the various sectors of its economy.

2.2. The potential of ICTs to contribute to economic growth

In the Information Age we currently live in, the concept of information economy, also referred to as knowledge economy,[29] is fundamental to understanding how modern societies operate in the business sphere. Low (2000:16, 308) defines an information economy as "one in which information is the core of a society's economic needs" or in other words "an economy in which the processing and transmission of information is a prime activity". What has been driving the spread of this new economic model is, to a large extent, the rapid development of ICTs such as computers and the Internet. In this kind of economy, knowledge, technology, and economic prosperity are intimately linked. As the very first paragraph of the World Bank Group's ICT strategy states,

> [k]nowledge is a fundamental driver of increased productivity and global competition. It is seminal to invention, innovation, and wealth creation. Information and communication technologies provide a foundation for building up and applying knowledge in the private and public sectors. Countries with pervasive information infrastructures that use innovative information technology applications possess advantages for sustained economic growth and social development. (World Bank Group, 2002:vii)

With respect to the developing world, the current trend towards increasingly globalized and technology-driven modern economies has led some to comment

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[29] In the literature on this subject, the terms "information" and "knowledge" are generally used as synonyms despite some semantic differences between them. ("Information" basically means the same as data while "knowledge" denotes internalized information that has been processed and interpreted in some way.) Throughout my thesis, I use the two terms interchangeably.

on the "Darwinian effects of technology" (Rivero, 2001:159). As Rivero (2001:7) observes,

> [t]he only comparative advantages of the underdeveloped world – abundant manpower and raw materials – are becoming every day less important to the global economy. [...] The new globalising technologies are [...] beginning to segregate the raw-material-exporting economies from the industrialised economies.

It is hence not surprising that some of the key expectations of Third World countries with regard to ICTs have to do with improving their economic performance.

Improved competitiveness on a national, regional, and global level is a core point that emerges out of the literature on ICTs and economic growth. Competitiveness is a broad concept and can mean a number of things. As a recent IDABC[30] publication prepared under the auspices of the European Commission suggests, on the most basic level, competitiveness can be defined as "the ability of an entity or a group (a company, a set of companies, a region, a country, a group of countries, etc.) to operate efficiently and productively in relation to other similar entities or groups" (IDABC, 2005:6). On the national level, it

> is based on superior productivity performance and the economy's ability to shift output to high productivity activities which in turn can generate high levels of real wages. Competitiveness is associated with rising living standards, expanding employment opportunities, and the ability of a nation to maintain its international obligations. (IDABC, 2005:5)

Thus, competitiveness is not merely an economic notion but rather is directly associated with the overall development of a nation. It is a multi-dimensional concept that implies different things to different entities:

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[30] IDABC stands for Interoperable Delivery of European eGovernment Services to public Administrations, Businesses and Citizens. For a full description of the organization, refer to http://europa.eu.int/idabc/.

> For a country, a region or a city, increasing competitiveness [...] translates into an economy-wide sustainable improvement in living standards; for an industry, into a dominant market position through the sale of high quality products; for a firm, into long-run growth in profits and sales through rising market share. (IDABC, 2005:7)

The role of ICTs in contributing to increased competitiveness can be varied, too. In most cases, developing nations hope that ICTs will help them increase efficiency and productivity, facilitate access to new markets, simplify current methods of work and production, as well as improve existing products and services and perhaps even create new ones.

Productivity is another recurring concept in the literature on ICTs and economic development. Productivity is generally identified as the main ingredient of competitiveness as it determines to a large extent the ability of enterprises, industries, and entire economies to compete nationally and internationally. Productivity growth refers to the "ability to obtain more output from given inputs of labour and capital", and it "depends on the quality of physical capital, improvements in the skills of the labour force, technological advances and new ways of organising these inputs" (IDABC, 2005:7). As the IDABC publication further points out, productivity growth is an important matter because historically it has been the driving force behind economic growth.

One significant point to keep in mind is the fact that direct causality between ICTs and economic growth has not been established. However, a "large number of econometric studies support [the] linkage between telecommunication and growth", and many other studies "highlight the strong correlation between IT and national prosperity" (World Bank Group, 2002:7). Thielemann (2003:iv), for instance, quotes in his work the research of Pippa Norris which clearly "suggests that the emergence of the Internet has even

reinforced the lead of industrial states during the phase of the new economy and widened the gap between the information rich and poor countries."[31] A large number of other authors similarly claim that ICTs were indeed the key to the rapid increase in productivity and competitiveness of the US economy in the late 1990s.[32] This relationship between ICTs, economic growth, and a nation's prosperity can be illustrated with the help of Figures 2.1 – 2.3, which compare the population and gross national product (GNP)[33] of different parts of the world with the number of Internet users and the human development index ratings.[34]

Yet the relationship between ICTs and productivity, competitiveness, and overall economic growth is far more complex than it might seem at first glance. For example, Edwards (2002:23) points out that "the contribution to U.S. growth of the computer-producing industries has been significantly larger than that of the computer-using industries." Drawing on a number of studies, the author also comes to the important conclusion that "investments in technology do not have a large direct effect on productivity. Their impact is indirect and is mostly related to

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[31] Unfortunately, I did not have access to the original document since it was a conference paper presented at the annual meeting of the political studies association of the U.K. at the London School of Economics and Political Science on April 10-13, 2000. The title of the paper was "The Worldwide Digital Divide".

[32] Almiron (2002) is one of these authors. Among others who support this view, the IIRSA publication (2003 "Volumen II":119) lists DeLong (2000); Stiglitz, Orzag and Orzag (2000); Stiroh (2001); Oliner and Sichel (2000); Jorgenson (2001); Crandall and Jackson (2001); Brynjolfsson and Hitt (2002); and Gordon (2002).

[33] The GNP refers to "the total value of final goods and services produced in a year by domestically owned factors of production" (Wikipedia, 2005). Increasingly, the GNP is being replaced by the gross national income (GNI), which refers to "the total value of goods and services produced within a country (i.e. its Gross Domestic Product), together with its income received from other countries (notably interest and dividends), less similar payments made to other countries. For example, if a British-owned company operating in another country sends some of their incomes (profits) back to UK, UK's GNI is enhanced. Similarly, a British production unit of an American company sending profit to America will reduce UK's GNI." (Wikipedia, 2005)

[34] The human development index (HDI) measures factors related with education and literacy, income levels, and life expectancy. Theoretically, the lowest possible value in the index is a zero (least developed) and the highest a one (most developed) (UNDP, 2004 "Human Development Report":259). In reality, however, the values range from approximately 0.25 to 0.95.

changes in other aspects of the productive process. Investment in information technology plays the role of a 'facilitator' that allows other innovations to take place" (Edwards, 2002:23-24).

FIGURE 2.1
Regional share of world's total GNP and population
Source: Source: Müller, 2003:54.

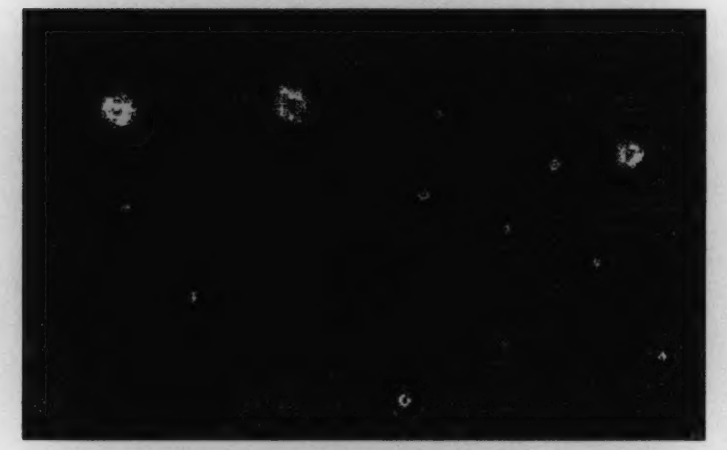

FIGURE 2.2
Number of Internet users
Source: Source: Müller, 2003:54.

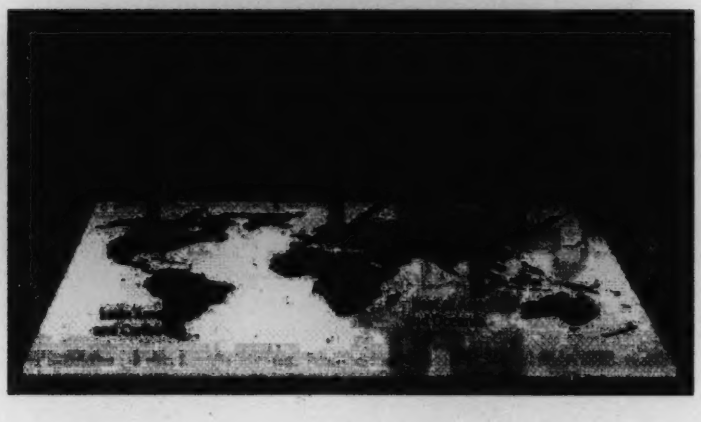

FIGURE 2.3
Human development index
Source: Source: Müller, 2003:55.[35]

Both of these insights are highly relevant to the context of Third World countries. The vast majority of developing nations either do not produce ICTs at all or their ICT-manufacturing sector still remains rather small. Hence, most of their hopes with regard to ICTs and economic growth are pinned on effective introduction and use of these technologies in the private sector, particularly in small businesses. Edwards' observations could serve as a wise warning to developing countries which at times continue to view ICTs as a panacea, have unrealistic expectations of them, or simply treat them as tools used to automatize certain processes. However, ICTs will not prove truly beneficial unless their implementation is accompanied by "investments in human capital, especially at the technical level" (Edwards, 2002:25) and geared towards supporting wider organizational changes such as "reorganisation of work procedures, restructuring of management, or changing the range of products and services offered by the

[35] Original maps in Figures 2.1 – 2.3 courtesy of Le Monde Diplomatique.

business firm" (Avgerou, 1998:18).[36] This might also be the reason why ICTs are effective especially in newly created businesses that are not burdened by a deeply entrenched organizational culture and an equally rigid structure (Edwards, 2002:25). As for existing enterprises, the IDABC study (2005:9-10) suggests that there is a "considerable time lag between ICT investment and returns, representing the time it takes for organisations to assimilate and adjust to new technology. During this period the adoption of ICT can even delay productivity growth." Such findings indicate that, especially with older businesses, the investment in ICTs is a complex long-term process. The contribution of these technologies to the increase in productivity, competitiveness, and overall economic growth is most likely to become perceptible and reflected in the statistics only several years after their implementation. Similarly, with respect to the impact of ICTs on a nation's economy, the IDABC (2005:9) study makes the following important point:

> The link between ICT and growth is strong in developed economies. Technology does drive growth – but only after a minimum threshold of ICT development is reached. In other words, ICT penetration and usage needs to attain a critical mass before it will make a significant positive impact on a country's economy. Once countries reach the threshold, increases in ICT development begin to have a positive effect on productivity and GDP per capita growth.[37]

If ICTs are implemented wisely and in the right organizational context, they certainly have the potential to contribute to economic growth. It is frequently noted that small businesses in particular are in a position to benefit a great deal from an increased implementation and use of these technologies. As the World

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[36] Edwards (2002:24) even claims that "making computer investment without organizational change, or only partially implementing some organizational changes, can create significant productivity losses".

[37] The gross domestic product (GDP) refers to "the total value of final goods and services produced within a country's borders in a year" (Wikipedia, 2005) and is the most commonly used indicator of a country's productivity (Low, 2000:43).

Bank Group (2002:36) strategy states, "MSBs' [micro and small businesses'] access to and use of ICT can have a profoundly positive impact on expanding customer markets and improving service, on expanding employees' skill sets, on lowering operating costs, and on increasing profitability." The predominant view seems to be that with the help of computer technology, these small businesses will become more efficient, productive, and competitive. By making use of the Internet and e-mail, for example, business owners and managers will be better able to supervise their staff, maintain contact with their suppliers and distributors, provide better customer service, and perhaps even offer some of their goods and services online. By gaining access to virtual markets through e-commerce, small enterprises will be able to market their products and services globally. This point is particularly important if we consider that many developing countries are heavily dependent on their exports and that "[w]ith the advent of the Internet, it is likely that the economic benefits of networking will be even greater in the future" (World Bank Group, 2002:7).

On a national level, ICTs also have the potential of opening up a number of entirely new employment opportunities. For example, in the more developed parts of the world, plenty of jobs are nowadays related to the manufacture of new ICT products. The development of software and the production, assembly, installation, and maintenance of hardware provide many employment opportunities that did not exist before the rapid advance of computer technology. Moreover, there is a growing number of services associated with these new ICTs such as specialized training and education, consulting services, and technical support. System analysts, programmers, webmasters, and database designers are all in high demand, and many other opportunities exist in fields like software

marketing, research, and development; computer-aided design; creation of geographic information systems; and electronic publishing.

Presently, some developing countries like India are not only leaders in software design but also successfully offer remote secretarial services, customer service support, as well as data entry and data processing services to major international companies. Already by 1999, these ICT-enabled services in India boasted a turnover of US$ 5.7 billion and included "processing of insurance claims for General Electric, back-office work for HSBC, digitization of handwritten airline tickets for British Airways, dictation of patient medical records from U.S. doctors, and keeping accounts for the World Bank Group" (World Bank Group, 2002:7). The growing popularity of such tele-services attests to the rise of a new technology-fueled trend referred to as teleworking. While it is true that some jobs might be lost due to the automatization or digitization of certain processes, it is also clear that ICTs are creating new employment opportunities. Particularly in developing countries, many of the jobs described above would have been previously available to people only if they migrated to the more developed countries. With the help of ICTs, citizens of developing nations can benefit from the new opportunities while remaining in their home countries and contributing to the growth of national economies.

To summarize, ICTs can increase the productivity, competitiveness, and economic growth of developing nations only if several other conditions are met. The early stages of implementation of these technologies require plenty of effort and capital, and positive changes are not immediate. Nevertheless, ICTs do offer the developing world numerous benefits that are becoming increasingly important in today's globalized world and can no longer be overlooked.

2.3. Peru's economy in the past and in the present

Latin America's economic record is just as turbulent as its eventful history. Periods of growth followed by deep crises, drastic reforms, and oftentimes extreme political changes are characteristic of most countries in the region. Overall, Latin America's economic development has been marked by uneven growth and numerous problems such as widespread corruption and poverty, leading to a lack of economic stability. Peru exemplifies many of the continent's past and present struggles.

Before the arrival of Spaniards in the New World, the indigenous populations inhabiting the territories of present-day Peru were organized into a highly structured society ruled by the Incas and based primarily on agriculture. Authors like Simpson (1994:275) trace Peru's current woes back to the destruction of the Inca Empire. Once the Spanish colonizers completed the conquest of the Inca territories in 1533,

> the people of the Inca Empire were made virtual slaves in their own country. The new colony was administered in systems which gave the appointed Spaniards, the *encomenderos*, total control over the local people in their charge. Their labour could be directed at will. Land was taken from Indian use and redistributed to the Spanish officials or sold to the Spaniards. (Simpson, 1994:275-76)

The new economic system implemented by the Spaniards focused on the extraction and exporting of gold, silver, and other minerals found in great abundance in the Andean highlands. Manufacturing and agriculture were largely neglected, with the latter gradually developing only when "the descendants of the original Spanish settlers began increasingly to organize their estates, the *haciendas*, and produce a range of crops both for local consumption and, in the case of sugar, cotton and tobacco, for export" (Simpson, 1994:277).

Independence from Spain in 1821 did not bring about any major changes to the ways in which the Peruvian economy was organized. Despite the fact that legislation was passed to ensure more equal land distribution, it mainly benefited the descendants of the colonizers while the Indians remained a source of cheap labor on the large *haciendas* and in the mines. After fighting two wars that greatly strained its resources, "Peru entered the twentieth century with an insecure, disorganized economy" in which "[p]olitical power [still] lay in the hands of a small group of landowners and mineral developers" (Simpson, 1994:278). The country continued to profit from large exports of metals and minerals as well as cotton, sugar, and agricultural products. However, the profits from the trade did not trickle down to the masses, and Peru became one of the many countries in Latin America to experience economic growth without development. The overdependence on the exports of raw materials also made the Peruvian economy vulnerable to the effects of fluctuating global markets. Particularly the recession of the 1920s and 1930s brought Peru's economic growth to a halt and caused the country to adopt the model of import-substitution industrialization (ISI). The approach promoted intensive industrialization, widespread state intervention in the economy, and national production of goods for local consumption instead of imports that strained the economy. While the ISI model initially led to growth, it supported unequal capital distribution and soon proved unsustainable for a number of reasons. Latin American countries

> were still dependent on the [N]orth for industrial machinery and because of the decreasing value of regional exports, governments borrowed heavily to finance these purchases. Capital-intensive industries provided fewer jobs than anticipated, pushing more and more women and men into the informal sector or unemployment. In addition, domestic markets could not support the model as the majority of the population was too poor to consume the goods being produced. (CIDA, 2004)

As a result of highly unsuccessful attempts at industrialization and agrarian reform, Peru once again came close to economic collapse in 1977-78. The debt crisis of the 1980s, characterized by harsh economic reforms and large cuts in public spending, followed. Once again, the poor were the most affected, and the quickly deteriorating living conditions led to violent insurgency and terrorism. It was only after President Alberto Fujimori came to power in 1990 that new economic reforms[38] stabilized the economy to a large extent. Terrorist guerrilla groups were virtually eliminated, and foreign investment started to flow in again.

Yet despite the fact that "the economic reforms of the [...] 90s have been positive for growth, there is considerable evidence that such growth has not created greater equality of opportunities" (CIDA, 2004) and hence has failed to contribute to sustainable development and long-lasting improvements in the standard of living for the majority of Peru's population. Even today, the country's economy bears many traits of the early post-colonial period. Strong economic and political divisions still persist, creating a situation where a "small elite of Spanish descent controls most of [Peru's] wealth and political power, while the indigenous peoples are largely excluded from both and make up many of the millions of Peruvians who live below the poverty line" (BBC, 2005 "Country Profile"). Manufacturing industry remains underdeveloped, and the country continues to rely on exports of raw materials such as copper, silver, gold, zinc, lead, crude petroleum and by-products, coffee, sugar, cotton, and fish products

[38] As Thielemann (2003:26) notes, "[t]his program initiated one of the fastest trade liberalization processes and one of the deepest labor market reforms in Latin America. These reforms included a radical privatization process, the abolition of all state-owned monopolies, the downsizing of the public sector, and an incisive tax reform."

(BBC, 2005 "Country Profile"). Finished goods are largely imported. As Simpson (1994:287) writes,

> [i]n the closing years of the twentieth century no less than 84 per cent of Peru's merchandise exports [were] made up of primary products. This is one measure of both her lack of economic diversity and vulnerability. Another measure of her economic and social failure is the deep poverty in which so large a proportion of her population live. The peasants of the Sierra [i.e. the highlands] have been virtually excluded from any improvements and in their thousands have flocked to the shanty towns around Peru's cities to seek an existence in the informal economy. In such a situation of deep poverty and few hopes it is small wonder that coca growing and the trade in cocaine flourishes in the Peruvian countryside and may well constitute Peru's major export.[39]

A precise breakdown of Peruvian labor force is difficult to establish since INEI does not publish this kind of statistics. According to the CIA (2005), in 2004 Peru's labor force by occupational category was divided in the following way: agriculture 5.9%, mining and quarrying 0.4%, manufacturing 12.6%, construction 5.3%, commerce 26.3%, household work 4.9%, other services 44.6%. However, these statistics do not seem entirely accurate. In fact, Peru's country profile on the CIDA website states that Peruvian economy is "primarily agricultural" (CIDA, 2001), and the mining and fishing industries play a fundamental role in the local business environment as well. Lastly, the informal sector is highly important in Latin America due to its sheer size and economic impact, but it is generally not reflected in the official statistics. A very large portion of Latin American income-generating enterprises are not registered with the national tax agencies and are hence deemed as informal. According to one research paper, the percentage of household heads in Lima who are actually registered with the tax office amounts

[39] The issue of poverty in particular will be addressed in detail in section 2.5 of this chapter.

to a mere 22% (Thielemann, 2003:25).[40] The activities of this sector are thus difficult to keep track and are not reflected in national statistics.[41]

The reasons for the rapid growth of the informal sector, particularly during the 1990s, are manifold. Thielemann (2003:25) blames the phenomenon on "the blend of economic and political inequality, widely-spread corruption, and a high degree of urbanization". Franko (2003:275) names "[l]ow investment in human capital development, particularly limited education and lack of professional skills" as factors contributing to poverty and rise of informality. On one hand, the informal sector offers a large number of Peruvians employment and income, no matter how unstable they may be, and provides the majority of the population with goods and services they would otherwise be unable to afford. On the other hand, informality also creates "chaotic circumstances and unordered developments" (Thielemann, 2003:26) and deprives the state of valuable tax revenues that could be invested in development projects or social programs.

Peru's low productivity and competitiveness aggravate its current economic problems even further. For instance, Table 2.1 reflects the GDP, the GNI total, and the GNI per capita of selected countries in North and South America.

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[40] Thielemann (2003) takes this number from a paper by Ana María Fernández-Maldonado presented at the International Research Seminar on the Social Sustainability of Technological Networks in New York on April 18-20, 2001. The title of the paper was "Diffusion and Use of New Information and Communication Technologies in Lima." As far as official statistics are concerned, the only study of the informal sector in Peru that I was able to find in INEI's online archives is largely outdated since it was published in August 1992.

[41] As Franko (2003:275) writes, "[s]ome basic guidelines that characterize informality include a low ratio between capital and labor, small-scale, worker-owned means of production, family-based operations involving children, and the virtual impossibility of accumulation of capital. The list of informal jobs with these characteristics is extensive, including mobile vendors, taxi drivers, small business owners, artisan manufacturers, maids, subcontractors, other services providers, and illegal businesses such as contraband or drug trafficking and professionals who work for themselves."

TABLE 2.1
GDP, GNI total, and GNI per capita of selected North and South American countries (2003)

Source: World Bank Group, <http://www.worldbank.org/data/quickreference/quickref.html>.

Country	GDP total (in millions of US$)	Ranking based on GDP total	GNI total (in millions of US$)	Ranking based on GNI total	GNI per capita (in US$)	Ranking based on GNI per capita
USA	10,881,609	1	10,945,792	1	37,610	5
Canada	834,394	9	756,770	8	23,930	24
Chile	72,416	46	69,193	45	4,390	75
Brazil	492,338	15	478,992	13	2,710	95
Mexico	626,080	10	637,159	10	6,230	68
Peru	**61,011**	**51**	**58,458**	**50**	**2,150**	**105**

It is clear from the statistics in the table above that Peru's productivity lags far behind that of the more developed nations, reflecting the country's inability to compete regionally and globally.

The competitiveness ratings published by the World Economic Forum confirm this point. The annual Growth Competitiveness Index (GCI) combines the ratings of three subindexes: the technology index, the public institutions index, and the macroeconomic environment index (World Economic Forum, 2004).[42] According to the competitiveness rankings for 2004, out of a total of 104 countries included in the index, only three Latin American countries[43] made it to the top 50%, with the remaining 15 countries of the region sharing the bottom 50% with the more impoverished East European and African states. Peru was among the countries that showed the largest drop, slipping from rank 57 in 2003

[42] The technology index evaluates innovation, technology transfer, and ICTs; the public institutions index focuses on law and corruption; and the macroeconomic environment index examines macroeconomic stability, investments, and government waste (World Economic Forum, 2004).
[43] These three countries were Chile (ranked 22nd), Mexico (ranked 48th), and Costa Rica (ranked 50th).

to 67 in 2004 (Lopez-Claros, 2004:xiii).[44] In an assessment of business competitiveness in particular, the World Economic Forum ranked Peru even lower, namely 76th out of 103 countries examined (Lopez-Claros, 2004:xviii).

In Latin America, the obstacles to sustained economic growth are numerous. Franko (2003:264), for example, identifies the lack of investment in human capital, and more specifically in areas such as health and education, as a core issue with respect to Latin America's low productivity and economic performance. There are also problems of endemic corruption, widespread poverty, vast inequalities, and soaring national debt – all interrelated and impacting the lives of millions of Peruvians. The consequences of decades of mismanagement cannot be easily erased. While struggling with the disastrous economic legacy of the past, Peru is at the same time facing the challenge of adjusting to the new demands of the Information Age. A well-planned implementation of ICTs can be an important step forward, but it will remain fruitless unless it is followed by wider changes in the way Peruvian businesses, industries, and economy are run.

2.4. ICTs and Peru's economic development

Despite numerous obstacles, ICTs are spreading throughout the various sectors of the Peruvian economy. Small entrepreneurs even in remote rural areas are learning to use computer technology and the Internet to their advantage. Although manufacturing of ICTs is almost non-existent in Peru, the new technologies have already opened up several new business opportunities such as the previously mentioned *cabinas públicas* and e-commerce sites. The

[44] With respect to the subindexes, in 2004 Peru ranked 71st on the technology index, 58th on the public institutions index, and 68th on the macroeconomic index (Lopez-Claros, 2004:xvi-xvii).

largest share of ICTs implemented in Peru is used by existing sectors of economy, and it is hoped that these technologies will make the local business environment more productive, competitive, and attractive to foreign firms and investors.

2.4.1. ICTs and existing enterprises

The list of the kinds of firms, businesses, and enterprises that in one way or another employ ICTs and computer technology in particular seems never-ending. Entrepreneurs in Third World countries are gradually beginning to take advantage of the benefits these modern technologies have to offer, too. With very few exceptions, developing nations generally fall into the category of ICT-consumers rather than ICT-producers. Peru is again a rather typical Third World country in this respect as it has not developed an ICT-sector, but rather imports ICTs and uses them to improve the functioning of the existing sectors of its economy (Bernstein, 2000).

As early as five years ago, researchers began to investigate the impact that computer technology and the Internet were starting to have on Peruvian businesses. Araoz and van Ginhoven (2002:59-60) point out that the first ones to incorporate computer technology into their operations were financial institutions, utilities companies (water and electricity), public administration, and real estate agencies. The use of computers and the Internet by smaller enterprises had a slower start in Peru. As one source reports, out of the approximately 700,000 small and medium-size Peruvian enterprises, only 5,600 subscribed to Internet services in 2001 (RCP, 2003). Another survey carried out a year before by Apoyo Consultores, a commercial market research group,

focused on the 2,000 most important Peruvian enterprises.[45] It revealed that only 50% of the companies surveyed had their own website and only 18% engaged in e-commerce.[46]

The most comprehensive survey aimed at assessing the level of ICT use in Peruvian enterprises was carried out in August 2000 by INEI (2001 "Indicadores"),[47] and it remains the largest nationwide research study conducted in this area. The survey was conducted among 6,769 medium and large-size Peruvian companies[48] from the production and the service sectors,[49] with the vast majority of the enterprises (78.2%) employing between five and 50 people (INEI, 2001 "Indicadores":74).

On the whole, the survey found a moderate level of penetration of computer technology in Peruvian enterprises and a rather low level of use of the Internet. The service sector showed better absorption of ICTs than the production sector. Still, 20% of all the companies surveyed did not have any computer equipment whatsoever and only 64.2% were connected to the Internet (INEI, 2001 "Indicadores":37). In case of the enterprises with online access, the Internet was used primarily for simple e-mail exchanges and other purposes listed below.

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[45] The results of this survey are mentioned in RCP (2003); however, the details of the survey and its methodology are not described. The survey is available from Apoyo Consultores only on special request and upon payment.

[46] Out of those 18%, 27% of the companies belonged to the industrial sector, 14% to the commercial sector, and 12% to the services sector. 88% carried out B2B (business-to-business) operations, and only 38% engaged in B2C (business-to-consumer) transactions.

[47] The findings of the survey were published in November 2001; hence the difference in dates in the bibliography.

[48] This means that all of the enterprises surveyed had five or more employees.

[49] According to the survey's definitions, the production sector includes the following subsectors: manufacture, agriculture, fishing, transportation and communications, construction, and electricity. The services sector includes enterprises from the commercial and services subsectors.

TABLE 2.2
The use of the Internet by Peruvian enterprises
Source: INEI, 2001 "Indicadores":38.

How the Internet is used	Percentage of companies
E-mail	60.9
Company web pages	22.9
Online database searches	15.6
Running FTP-servers	6.5
Video conferences	0.8
All of the above	1.2

Another discouraging finding was the fact that even when a company was connected to the Internet, in 75.9% of the cases only between one and five employees actually had access to the Internet (INEI, 2001 "Indicadores":44). The enterprises did not show much interest in participating in e-commerce, either. In fact, an overwhelming 79.4% of them did not engage in any form of e-commerce at all (INEI, 2001 "Indicadores":47).[50]

Overall, the results of the survey clearly indicate that there still remains a lot of room for improvement. INEI's report repeatedly emphasizes the fact that for an enterprise nowadays not to make use of computer technology means fewer possibilities to conduct business, limited access to valuable information on issues such as investment opportunities or legal matters, and less dynamic relationships with its clients and providers. For the internal divisions of an enterprise, like administration, accounting, and distribution, a limited use of ICTs can also mean lack of systematic organization, coordination, and easy access to relevant information (INEI, 2001 "Indicadores":16). In other words, the absence of ICTs in modern enterprises can slow down their performance and render their

[50] I will discuss the findings of the survey with respect to e-commerce in particular in section 2.4.3.

functioning less efficient. With the help of computers and the Internet, relevant information would be available in a matter of seconds, and communication among entrepreneurs, customers, providers, and distributors would be easier to maintain.[51] However, INEI's report concludes with the worrying observation that despite the potential benefits, only 6.7% of the Peruvian enterprises surveyed are investing in acquisitions of any kind of technology (INEI, 2001 "Indicadores":60). This lack of investment in technological modernization is blamed primarily on economic recession as business owners prefer to wait for better times to start implementing large-scale organizational changes.

In order to assess the sophistication of Internet use among commercial organizations in Peru, Thielemann (2003) conducted a separate survey, published as part of his study on Internet diffusion in Peru in 2003. The author randomly chose five large, publicly traded corporations from each of Peru's key economic sectors: agriculture, energy, finance, fishery, industry, insurance, mining, retail, services, and telecommunications (Thielemann, 2003:114). Out of the 50 organizations surveyed, 26% either did not have a website at all or its URL was invalid. As for the corporations that did have an online presence, in 68% of the cases the websites focused on providing information about the company and its products and did not offer interactive services. Only 26% of the organizations – primarily from the finance, telecommunications, and retail sectors – allowed the users to carry out some financial transactions online. None of the corporations included in the study showed signs of creativity and innovation

[51] On the other hand, one also has to consider the negative potential of ICTs in the business environment. For example, when given unrestricted access to the Internet, employees might be tempted to use e-mail or online chat-rooms for personal purposes instead of using these technologies strictly for work. Overall, however, I believe that the benefits of introducing more computer technology and Internet access into businesses outweigh such drawbacks.

where the uses of the Internet were concerned (Thielemann, 2003:115). While the results of the survey indicate a sophistication of Internet use in Peru that seems quite acceptable as for a developing country, it is important to note that the numbers are not representative of the majority of Peruvian enterprises. Thielemann (2003:115) himself briefly mentions the fact that

> [s]ince the sample pool consists of companies whose stock is publicly traded, it is very likely that it contains a disproportionate number of Internet-savvy organizations. As a result, the data that was ascertained suggests probably an upper bound on sophistication of use among Peruvian Internet-using organizations as a whole.

It could be concluded from the surveys described that while the use of computer technology and the Internet is gradually spreading throughout Peru's economic sectors, larger corporations still do not utilize the full potential of these technologies. Smaller enterprises lag behind even further as often they cannot even afford to acquire the equipment. However, signs of progress are emerging, and interestingly, they frequently come from entrepreneurs in rural areas.

ICTs hold great potential for small business owners, farmers, and artisans in remote rural villages. First of all, computer technology and the Internet allow these individuals to easily access information that could be of great value to them. It could be information about prices, production levels, market fluctuations, weather conditions, or even about projects relevant to their communities and financial or governmental services available to them. Secondly, ICTs allow the inhabitants of isolated areas to establish or improve communication with prospective buyers, creditors, or investors. The Internet and e-mail can also contribute to a wider exchange of experiences among farmers, artisans, and other rural entrepreneurs. The World Bank Group's publication gives many

concrete examples of the economic benefits ICTs can bring to the inhabitants of the more remote parts of a country.

> Farmers and other rural businesses can obtain the highest possible price for their goods and bypass intermediaries. In addition, supplies and other equipment can be found for the lowest possible price. Communication is integral to knowing what, where, when, and how to plant crops. In particular, global positioning satellites are increasingly being used to map soil productivity in areas as small as two hectares. Similarly, satellite imagery and Internet communication can be used to transmit data on emerging crop infestations, track weather patterns, and monitor expected yields. Rural businesses can increase their sales range, resulting in increased production, and hence employment. In terms of efficiency, the reduction of unnecessary travel alone can have a major impact on the productivity of rural businesses. (World Bank Group, 2002:64)

Apart from these benefits, ICTs such as the Internet allow rural farmers to reduce the overall costs of production, gain access to the findings of the most up-to-date research studies, share their knowledge and experience with others, and obtain information to help them better plan their efforts and investments. In fact, in developed nations such as the UK and New Zealand, 60% of farmers are reported to use the Internet for work-related purposes as well as for e-commerce; in the US this number is estimated to be around 43% (Cerna de la Torre, 2003).

Several examples from rural communities in Peru confirm the above claims. One of the earliest ones, described by Constance (1997), is that of the farming cooperative in Chincheros, an area located in Peru's highlands near Cuzco. Only a few years back, the 50-member community would earn about $113 a month from sales of potatoes, chili peppers, and other agricultural products at the local market. Yet the determination of the village priest to find a more profitable market for the produce, combined with access to a computer with an Internet connection, soon allowed the community to increase its income more than tenfold. Upon consulting an international database of agricultural importers, the priest and one of the farmers made direct contact over the Internet with a

retailer located in New York City who showed great interest in the exotic species of organically grown potatoes from Chincheros. Currently, the cooperative makes approximately $1,300 a month from direct exports to the US (Constance, 1997).

An even greater success story described in IIRSA (2003 "Volumen II":63-64) is the case of Cotahuasi, a town located in the midst of one of Southern Peru's most remote and neglected areas. Public infrastructure in this part of the country is in a dismal state, thus severely limiting accessibility, and the annual per capita income is approximately US$ 250, an amount far below the national average. AEDES,[52] a non-governmental organization active in the area, originally established a telecenter in Cotahuasi in response to the demand of public administration for Internet access. With time, the telecenter came to be used by the community at large. In particular, AEDES assisted local producers of organic kiwicha, a grain cultivated in Peru for centuries, to find a market for their product in Europe. The growers of Cotahuasi gradually established an enterprise that now includes 235 families. The value of the products exported by the enterprise in 2001 was estimated to be around US$ 350,000. The achievement was the culminating point of nine years of hard work, intensive online marketing, and contacts established through an expensive and deficient dial-up connection to the Internet.

A more recent example is the Agricultural Information Project for Farmers of the Chancay-Huaral Valley (BBC, 2004). In September 2004, after three years of intensive planning and implementation, a network of 14 computer telecenters was inaugurated in the valley located about 80 km north of Lima. The centers

[52] AEDES stands for Asociación Especializada para el Desarrollo Sostenible (trans. Specialized Association for Sustainable Development).

rely on affordable computer equipment, open-source software, and wireless Internet access, which allows them to overcome the obstacle of lacking telecommunications infrastructure. Their primary users will be the 6,000 local farmers, but the facilities will also benefit the 13,000-strong general population and 18,000 students who live in the area. Moreover, the telecenters offer not only access to computers and the Internet, but also training on how to use these technologies and how to find relevant information online. One core element of the initiative is the Agricultural Information System[53] that provides the farmers with the latest information on market trends, prices of agricultural products, farming techniques, fertilizers, and plague prevention. The network will also facilitate communication and better coordination of activities among administrators of the numerous water irrigation systems that are crucial to the valley's prosperity.

The US$ 200,000 project was carried out primarily by the Peruvian NGO CEPES[54], with support from local institutions, Peruvian Ministry of Agriculture, and OSIPTEL. It is estimated that within the next three years, all of the telecenters will become fully self-sustainable as they will generate sufficient funds from the nominal fees charged from their users. Although the project is currently in its pilot stage, the local population has demonstrated its commitment to its success through active involvement in all the stages of its implementation. One of the most encouraging signs was the high participation in the preliminary training sessions, attended particularly by the younger generation who often leave their rural hometowns for larger urban centers because of lack of local opportunities. All in all, the Agricultural Information Project of the Chancay-

[53] Its website can be accessed at http://www.huaral.org/main.shtml.
[54] CEPES stands for Centro Peruano de Estudios Sociales (trans. Peruvian Centre for Social Studies).

Huaral Valley is an excellent example of an initiative targeted specifically at the needs of one particular agricultural community.

The potential that ICTs hold for rural businesses is clear, and numerous communities from some of the most remote parts of Peru are showing great initiative and creativity in adopting these technologies to their particular needs. With more funding from public institutions or non-governmental organizations, which would allow such communities to acquire even one or two computers with a connection to the Internet, and a helping hand of someone with the necessary know-how, ICTs could make a big difference for the inhabitants of some of Peru's most remote and impoverished areas.

2.4.2. ICTs and new business opportunities

Apart from improvements ICTs can bring to the existing sectors of economy, the rise of these technologies has also created a number of entirely new business opportunities. Indeed, the ICT industry in developed nations is frequently treated as a separate sector that includes all kinds of enterprises either manufacturing ICTs (software, hardware, electronic parts, etc.) or offering ICT-related services (technical support, Internet service providers, IT consulting, etc.).

Several developing nations have taken advantage of the rapidly increasing demand for ICT products early on. As Steinberg (2003:46) notes,

> [m]odern ICT began to have an impact in some developing countries even before widespread adoption of the Internet. In Brazil, for example, the computer industry accounted for more than 74,000 jobs and $4 billion in revenue by 1990. In 1988 India launched a set of policies that fostered a software-development industry whose exports grew to $5.7 billion by 1999-2000.

As for Peru, a stronger ICT-producing sector would be an ideal way to diversify the country's exports. Yet in 2002, Peru's high-technology exports[55] amounted to a mere 1.9% of all manufactured exports, compared to Canada's 14.3%, Mexico's 21.4%, and United States' 31.8% (World Bank Group, 2004). Since the levels of software development and hardware production in Peru are close to zero, there are no statistics or research studies available on the topic (Canal, 2004 "Domestic Production"). The low levels of ICT-manufacturing are easily explained. As far as satisfying the domestic demand for ICTs, it is far more cost-effective for local enterprises to offer their clients pirated software and computer equipment assembled from cheap parts imported from Asia. It is estimated that 40% of computers currently used in Peru were put together by local computer technicians, and approximately 90% of all the software used in the country is pirated (RCP, 2003). The development of a competitive ICT industry in Peru would require plenty of time, research, and above all funds that the country is desperately lacking.

Peru is thus highly unlikely to become a large-scale ICT-manufacturer in the near future. Nevertheless, there are plenty of other business opportunities created by the ever-increasing demand for ICTs and ICT-related services. An example of a local phenomenon that has gradually spread throughout the rest of Latin America is the so called *cabinas públicas* – a Peruvian version of Internet cafés, which I will henceforth refer to simply as *cabinas*.

The *cabinas* are functional spaces equipped with computers connected to the Internet that resemble a computer laboratory more than a café. By charging their users hourly rates which do not exceed US$ 1, they offer a highly affordable

[55] The World Bank Group defines high-technology exports as "products with high R&D intensity, such as in aerospace, computers, pharmaceuticals, scientific instruments, and electrical machinery" (World Bank Group, 2004).

way for the majority of Peruvians to access the Internet or to gain some computer experience. Originally, such facilities were an urban phenomenon centered in Lima, with the very first *cabina* opened by RCP in 1995 in the upper-middle class neighborhood of Miraflores (Fernández-Maldonado, 2000:3). The popularity of the model spread rapidly, and the *cabinas* soon became one of the most profitable business opportunities the Information Age has offered Peru so far. Nowadays, it is easy to find them all over Lima, in fairly wealthy neighborhoods as well as in shanty towns.[56] According to the results of a survey published by OSIPTEL in 2002, 87% of all Internet users in Lima accessed the Internet from the *cabinas* (San Román, 2002:8). By now the phenomenon has reached the more remote areas of the country, too, so that even small towns in the highlands and in the jungle tend to have at least one such facility. It is hence often remarked that the *cabinas* "created a new market in Peru and helped to democratize the Internet in the country" (Thielemann, 2003:52) by making computer and Internet access affordable enough even for the less privileged Peruvians.

It is difficult to estimate the total number of *cabinas* that currently operate in the country since the model developed spontaneously, without any central supervision or systematic planning. Also, while the larger facilities are located in shopping centers and along popular streets, most of them are run as small family businesses and form part of the informal sector. According to OSIPTEL's findings (San Román, 2002:10), 90% of the *cabinas* in Lima are operated independently by the owner or a relative or friend of the owner and only 10% belong to a commercial chain of *cabinas*. Approximately 30% of them operate out of the family home and 70% use rented space. The *cabinas* serve an

[56] For images of what a typical *cabinas* facility looks like, see the Appendix.

average of 55 users per day and charge from S/.1.5 (US$ 0.46) to S/.3.5 (US$ 1.08)[57] per hour. Most of the facilities are equipped with an average of 12 privately assembled computers.

There are several reasons for the great success of this particular model of accessing the Internet. First of all, Fernández-Maldonado (2000:4) attributes the popularity of this particular Peruvian phenomenon to the absence of an efficient and inexpensive system of telecommunications in the country. While the demand for information and communication is high, most of Peru's areas have been neglected with respect to public telecommunications infrastructure. Also, approximately two million Peruvians live abroad, and their relatives back home, faced with a high cost of long-distance phone calls, frequently resort to e-mail, chat, or IP-telephony to communicate with them (Thielemann, 2003:52). Another determining factor is the large proportion of youth in the general population. It is usually the younger generations who show the greatest curiosity in new technologies. For them the Internet opens up a whole world of new possibilities. In most cases, however, these youths do not have access to computers and the Internet at home. All these reasons combined explain the fact why 77% of those who frequent *cabinas* are teenagers and young adults (San Román, 2002:12). There is also the belief, shared by Peru's general public and reflected in several studies and surveys, that computer skills are highly important for progress and for finding better employment (Fernández-Maldonado, 2000:4). Many *cabinas* organize computing courses or tutorials, and most of them hire personnel, mainly young adults with some computer training and experience, to offer free technical

[57] For the currency conversions I used the Universal Currency Converter available at http://www.xe.com/ucc/. The conversions were performed on April 9, 2005.

assistance and show the first-time users some basic steps of surfing the Net, chatting, or opening an e-mail account.

Despite their success, and partly because of it, the *cabinas* face a number of challenges. Apart from problems related with the largely informal nature of many of the enterprises as well as frequent break-ins and burglaries, perhaps the biggest challenge is the strong competition. To expand their customer base and maintain customer loyalty, the owners of the *cabinas* usually resort to different marketing strategies such as handing out little gifts like pens or pencils or rewarding their clients with an hour of free computer use for every five or six hours of paid time (Fernández-Maldonado, 2000:3). Most of the *cabinas* also offer snacks and drinks for sale along with some additional services like international calls via the Internet, video-conferencing, online games, typing, printing, photocopying, fax, scanning, binding, website design, computing classes, and others. In addition to the above tactics, "[o]ther methods that owners of *cabinas* employ in order to stay competitive are the employment of family members instead of trained personnel, the use of pirated software, or avoiding to pay rent by taking advantage of space in family owned premises" (Thielemann, 2003:52). Indeed, it is common to find *cabinas* located in the garage or on the first floor of the family home.

In conclusion, it can be said that the "sustained success of the *cabinas* model has proven that this and similar concepts can not only help to facilitate Internet access for underprivileged sections of the population of a country but can also be financially sound" (Thielemann, 2003:52). The Peruvian model demonstrates that targeting the low-income groups does not necessarily have a negative impact on the profitability of this kind of ICT business. This is particularly true in a setting like Peru, where the poor make up the majority of the

country's population and yet are equally as curious as the rich about the new technologies.

The *cabinas* are only one example of a new business opportunity created by the demand for more access to ICTs. With increased implementation of ICTs throughout the various sectors of Peruvian economy, ICT-based ventures can only be expected to grow as the demand for services such as technical support, computer training, hardware maintenance, and others increase.

2.4.3. E-commerce and telework

Two particularly noteworthy opportunities that have emerged during the Information Age are electronic commerce (e-commerce) and telework. Both can either enhance existing businesses or lead to the creation of entirely new enterprises. Both also lack popularity in developing nations such as Peru but hold great promise for future development.

With respect to e-commerce, a number of studies and estimates confirm this potential. Despite the fact that the surveys conducted on the topic by different firms and institutions use different methodologies and arrive at different numbers, they all point to significant growth of Latin American e-commerce. Franko (2003:297), for instance, notes that although "Latin America's e-commerce purchases were only $194 million in 1999, [...] they are estimated to grow to $8.3 billion by 2005."[58] Another study conducted by the Boston Consulting Group appears to confirm these projections as the value of electronic B2C (business-to-consumer) transactions in Latin America was reported to have reached US$ 1.28 billion in 2001 (San Román, 2002:14). Currently, the

[58] Franko (2003) bases this number on statistics from the US Department of Commerce published in June 2000.

undisputed Latin American leader in e-commerce is Brazil, followed by Mexico and Argentina, with Peru responsible for a mere 0.09% of the total value of online transactions (Araoz and van Ginhoven, 2002:70; San Román, 2002:14).

Widespread popularity of e-commerce indicates that Internet use in a given country is sophisticated enough to allow people to perform financial transactions online and that such transactions have become an accepted means of conducting business. The users must also be comfortable working with the new technologies and must have developed trust in them. In the case of Peru, e-commerce is still in the early stages of its development. As of 2003, the percentage of Peruvian enterprises participating in e-commerce was reported by some sources to be as low as 0.16% (Canal, 2004 "ICT Usage"). Similarly, the surveys discussed in section 2.4.1 revealed a very low use of e-commerce, with the vast majority of the transactions occurring between businesses (B2B) and only a small share of them consisting of direct consumer purchases (B2C).[59] According to the results of a survey conducted by Apoyo Consultores in 2002 and quoted by RCP (2003), 92% of the respondents, all of whom were frequent Internet users, have never realized any kind of online purchase.

Still, e-commerce is showing a steady growth in Peru. Thielemann (2003:120-21) observes that "[f]rom a total revenue of $5 million in 1999, the market more than doubled within two years and recorded a total volume of $11.5 million in 2001." Araoz and van Ginhoven (2002:70) have arrived at similar numbers. As the authors report, by the end of 2000, online sales in Peru in the B2C category were valued at US$ 10.9 million while online B2B transactions were estimated to have reached around US$ 90–100 million. It is predicted that

[59] A large number of studies does not differentiate between B2B and B2C e-commerce; however, in most cases, the statistics seem to focus more on B2C transactions.

Peruvian e-commerce activity should generate revenue of US$ 164 million by 2005 (Thielemann, 2003:121).

Among the larger and better known businesses that offer products online are the supermarket chain E.Wong and the virtual store I quiero.[60] So far E.Wong is the only supermarket in Peru to offer consumers online services. Its sophisticated portal not only allows customers to view products and special offers, but it also allows them to take a virtual tour of a typical E.Wong supermarket, create their own shopping list, and even order their groceries online and have them delivered to their home free of charge. A more recent service that has been added is the ability to purchase a pre-paid shopping card. The idea is to enable Peruvians living abroad to purchase the shopping card as a gift for their relatives residing in Peru. The card can also be recharged online.

In fact, online sales portals that target Peruvians living abroad are quite common. The largest and most renowned one in this category is I quiero. The website is accessible either directly or from the most popular Peruvian news sites like Terra Perú and Peru.com, and it features a wide variety of items from Peruvian retailers. Peruvians from abroad can purchase these products online and have them delivered either to their address abroad or to their relatives and friends residing in Peru. Apart from the more traditional gift items such as flowers, chocolates, or stuffed animals, on I quiero one can also buy clothes, furniture, appliances, medical insurance, and tours of Peru. Among the more interesting gift options offered is a live show of either mariachis or popular children's entertainers to be performed in the home of the relative residing in Peru. For a fee of US$ 3.50, I quiero even offers the service of taking a digital

[60] Their respective websites can be accessed at http://www.ewong.com/ and http://secure.iquiero.com/peru/.

photograph of the family receiving the gift and delivering it to the buyer's e-mail account within the following 48 hours.

Another much smaller but equally interesting e-commerce initiative that has attracted a lot of attention is Tortasperú.[61] This particular e-business venture relies on a network of housewives in seven Peruvian provinces who take electronic orders for cakes and deliver the freshly baked goods on the date specified on the order. The website of Tortasperú features the pictures, descriptions, and prices of 20 different kinds of festive cakes. Peruvians from abroad are able to place an order for the desired cake, pay for it by credit card or in a number of other ways listed on the website, and have the cake delivered to a specified address in Peru. Along with a receipt, online customers receive a photograph of the delivery being made by e-mail.

The initiative is noteworthy not only because it takes a simple idea and with the help of the Internet turns it into an income-generating venture, but also because it involves women, particularly women who are often unable to work outside their homes. In the developing world and in Latin America especially, women are generally at a higher risk than men of becoming poor (Franko, 2003:351). Hence, Tortasperú allows the most vulnerable part of society to generate income, however modest it may be. Tortasperú is open to join for any Peruvian housewife with some baking experience. Basic computer training and technical support are provided to the women free of charge. Participation in the network is not limited by the condition of having a computer at home, either. The members can easily access the Tortasperú website and the orders mailed out to them via e-mail from the numerous *cabinas* (San Román, 2000). As the founder and co-owner of Tortasperú noted, "[o]ur model of e-business is easy and fairly

[61] The website of Tortasperú is located at http://www.tortasperu.com.pe/.

inexpensive to implement. It can be replicated in other countries, with other products. One needs only imagination, willingness to work and openness to using technology" (San Román, 2000).

While ICTs have changed ways of conducting business in the Information Age, with respect to employment in general, they have also contributed significantly to the rise of teleworking. The term literally means "working from a distance" and refers to performing one's job from a place other than the traditional office or the physical place of employment. Telework is frequently equated with working from home, but it can also involve a call center representative in India providing customer service for a North American firm, for example. The possibilities are many, and teleworking seems to be another growing trend on today's job market. One particular advantage of telework is that it can and does offer valuable employment opportunities to persons unable to work away from their homes or to inhabitants of rural or remotely located areas. In Peru, most of the country's economic activity is concentrated in Lima. However, opportunities for obtaining higher education at universities and colleges exist in other Peruvian cities, too. Skilled and well-educated professionals can be found all over the country, but their opportunities are often limited unless they decide to migrate to Lima. Although telework generally requires some initial investment in equipment, an Internet connection, and perhaps some computer training, it could prove a highly viable and profitable alternative to traditional employment. It can also offer individuals more flexibility, more independence, and above all more income-generating opportunities.

Both e-commerce and telework hold much potential of which Peru is still not taking full advantage. These particular uses of ICTs seem to represent, at least for the present moment, opportunities to be developed at a later point in

time. The obstacles preventing Peru from embracing e-commerce and telework on a larger scale are still numerous and will be dealt with in detail in section 2.6.

2.5. ICTs and poverty reduction

In the previous sections, I have described examples of how ICTs can contribute to Peru's economic growth by improving the functioning of existing enterprises as well as by creating new business opportunities. Yet there remains one fundamental problem to be discussed, a problem so widespread and severe that it has prevented Latin America from achieving economic well-being for decades: poverty.

From all the characteristics we generally associate with the Third World, poverty is perhaps the most striking and persistent. The poor are generally defined as "the portion of the population unable to meet basic needs such as food, health care, education, and shelter. The poverty line is determined as the minimum income needed to purchase socially determined essentials for living" (Franko, 2003:341).[62] At a national level, poverty manifests itself "by some combination of low per-capita income (technically expressed as low Gross Domestic Product per capita), highly unequal income distribution, poor infrastructure (including communications and transportation), limited use of modern technology, and low consumption of energy" (Handelman, 2003:3). According to Franko (2003:340),

> [t]he social challenges of poverty and inequality constitute the greatest obstacle to sustained economic growth in Latin America. One in three inhabitants of the region – approximately 150 million people – live below the poverty line. Poverty constrains human beings from investing in the education and health necessary for productivity. Inequality skews opportunities toward the rich, not those who desperately need it.

[62] This is also the definition used by INEI, Peru's official statistics agency. For reference, see Herrera (2002:11).

In the case of Peru, it is not only the widespread existence of poverty that is shocking, but also its severity, especially in the rural parts of the country. Table 2.3 illustrates to what degree the various areas and natural regions of Peru are impacted by poverty, with the highest and the lowest numbers appearing in bold print. The enormous gap between urban and rural areas, particularly between the capital city of Lima and the rural areas located in the highlands, is immediately apparent. Apart from the fact that the prevalence of poverty is far higher in rural areas than in the cities, rural inhabitants are on average three times poorer than city dwellers. Also, the risk of becoming poor is twice as high in rural areas as it is in the cities (Herrera, 2002:11-12).

TABLE 2.3
Peru's population living in poverty and extreme poverty[63] by area and/or natural region (2001)

Source: Herrera, 2002:14.

Type of area and/or natural region	Percentage of total population living in poverty	Percentage of total population living in extreme poverty
Urban	42.0	9.9
Rural	78.4	51.3
Coast	39.3	5.8
Highlands	72.0	45.6
Jungle	68.7	39.7
Urban coast (excl. metropolitan Lima)	44.6	7.6
Rural coast	62.7	19.7
Urban highlands	51.6	18.3
Rural highlands	**83.4**	**60.8**
Urban jungle	62.4	34.9
Rural jungle	74.0	43.7
Metropolitan Lima	**31.9**	**2.3**

[63] The percentage of population living in poverty also includes those living in extreme poverty.

The high incidence of extreme poverty translates into a vast portion of Peruvian society being unable to satisfy their most basic needs such as food. Especially for children, lack of proper nutrition can significantly compromise their health and growth and can lower their performance in school. Peruvian students frequently repeat a school year, get discouraged, and ultimately drop out, thus limiting their future employment opportunities (Herrera, 2002:12). The majority of the poor have little choice but to join the informal sector and continue living in dire conditions, with no running water, electricity, or proper health care services. Table 2.4 illustrates the stark differences with respect to poverty in the largely coastal administrative region of Lima[64] and in the rural region of Huancavelica located in the highlands.

TABLE 2.4
Selected characteristics reflecting poverty for the administrative regions of Lima and Huancavelica (2001)

Source: Herrera, 2002:14, 163-64, 175-76.

Characteristic	Lima	Huancavelica
Percentage of total population living in poverty	33.4	88.0
Percentage of total population living in extreme poverty	3.1	74.4
Percentage of primary providers in the household currently employed	76.0	96.3
Percentage of primary providers in the household currently employed in the informal sector	65.1	85.8
Net monthly income per capita (in nuevos soles)	535.00	157.20
Percentage of primary providers in the household with only primary education or no education	30.5	68.6
Percentage of households with running water	73.7	34.3
Percentage of households with electricity	95.0	30.6

[64] Lima is the name of the administrative region in which the capital city bearing the same name is located.

The ways in which ICTs could help bring about change to the regions most affected by poverty are numerous. Success stories like those of the rural communities of Chincheros and Cotahuasi are becoming increasingly common, and wireless technologies promise to bring new opportunities even to remotely located and inaccessible areas that have been neglected for decades. Computer technology and the Internet have already changed the ways in which we conduct business, search for jobs, and work. Furthermore, besides enhancing the way existing enterprises function, ICTs can also improve the overall quality of employment. This is a highly important point since it is not the lack of employment but rather the low quality of it that is a characteristic associated with poverty in Peru and in many other developing nations. According to the International Labour Organization (ILO, 2004),

> [t]oday there are 550 million people who work, but still live on less than US$ 1 a day. These 'working poor' represent 20 per cent of total world employment. In spite of the record levels of global unemployment, the reality for most of the world's poor is that they must work – often for long hours, in poor working conditions and without basic rights and representation – at work that is not productive enough to enable them to lift themselves and their families out of poverty. While it is clearly the case that employment is central to poverty reduction, it is 'decent and productive' employment that matters, not employment alone.

Herrera (2002:41) confirms these observations by pointing out that in comparison with the primary providers in an average Peruvian household, the primary providers in the poor households work a greater number of hours and a larger percentage of them have more than one job. With the help of modern technologies, it is not only the quantity of jobs but also their quality that could improve.

To conclude, it should be said that ICTs must not be treated as a panacea to poverty. However, these technologies can bring about positive

change provided they are implemented with accompanying training on how to use them and in a way appropriate to the local context and needs.

2.6. Challenges

Most of the challenges Peru is currently facing with respect to ICTs in the business sphere fall into one of three major categories: the implementation of these technologies in small enterprises, e-commerce, and the general lack of a national strategy that would allow the various economic sectors to work towards technological progress in a systematic and organized manner.

In Peru there are approximately 700,000 small and medium-size businesses (RCP, 2003). It is estimated that they are responsible for generating about 75% of Peru's total economic activity and were hailed by the Peruvian president Alejandro Toledo as "the engine of growth of our country" (Cavassa, 2002:15). Yet while large businesses such as banks and utilities companies embraced ICTs a long time ago, the surveys described previously show that smaller enterprises still make little use of computer technology and the Internet. The obstacles to wider use of ICTs by these small entrepreneurs are primarily socio-economic, and among the most important issues the World Bank Group (2002:36) identifies the following:

> (a) network infrastructure access costs, (b) lack of awareness and knowledge about the potential uses of ICT, (c) the up-front cost of a personal computer and modem, (d) lack of training for skills development on ICT, and (e) lack of easy-to-use, sector specific software and available local content.

Peruvian small business owners face all of the above obstacles. For example, the cost of a personal computer in Peru is around US$ 900, an amount equal to

ten times the minimum monthly salary of a Peruvian worker (Rivadeneyra, 2003:78).

Furthermore, various studies have shown that ICTs are most effective in new enterprises (Edwards, 2002:29). This would mean that if a country is truly committed to spreading ICTs and maximizing their impact in the various sectors of its economy, it should facilitate the process of starting a business and reward those launching technology-driven ventures with tax breaks or other incentives. Yet as Edwards (2002:29) points out,

> [e]xisting information suggests [...] that the Latin American countries continue to be overregulated and asphyxiated by red tape. [...] [M]ost of the region continues to be imprisoned by surreal volumes of paperwork and inefficiency. For instance, it takes over a year to obtain all the federal and local permits and licenses required to start a small business in Mexico City.

The situation is not much different in Peru; hence, many businesses can only afford to operate on a semi-legal basis as part of the informal sector.

One important organization offering support to newly established ICT firms is Instituto Nacional de Investigación y Capacitación de Telecomunicaciones (INICTEL).[65] Funded by the Peruvian government and devoted to promoting technological development among Peruvian enterprises, INICTEL's incubator program assists new technology-based businesses with the tools, training, and consulting services necessary for the entrepreneurs to become successful. The institute provides help with filing the proper paperwork associated with launching this kind of venture, affordable rental of electronic equipment, and free hosting of web pages. In particular, the incubator project targets young graduates from universities and technical institutes who intend to start their own ICT businesses (INICTEL, 2005).

[65] Trans. National Institute of Research and Education of Telecommunications.

There are many merits to the INICTEL initiative. Yet the fact that the institute has existed since 1999 and has so far seen only five enterprises through the full incubation process[66] indicates that INICTEL's incubator program is not a large-scale initiative and has not made a significant contribution to technological development among Peruvian businesses overall. Also, the long-term effectiveness of such incubator initiatives in the Peruvian context still needs to be researched and critically assessed.

Apart from funding organizations like INICTEL on a regular basis, Peruvian government occasionally raises funds for ICT projects by signing agreements with representatives of international ICT companies. For example, one such major agreement was signed between Microsoft chairman Bill Gates and Peruvian president Alejandro Toledo on July 15th, 2002. Along with various kinds of technical assistance, Microsoft agreed to donate approximately half a million dollars towards the development of computer technology in Peru (Cavassa, 2002:16). A large part of the funds pledged by Microsoft was meant to help the small businesses in particular. Approximately US$ 200,000 was earmarked for the training of 18,000 entrepreneurs in the possible applications of computer technology in their businesses along with 600 ICT mentors who would provide technical support to these enterprises in the future (Cavassa, 2002:14).

While in the case of developing countries every financial contribution matters, the agreement signed between the Peruvian government and Microsoft left several questions unaddressed. First of all, it did not specify how the entrepreneurs to be trained would be chosen and whether the group would include small business owners from rural areas and the more disadvantaged

[66] Only five firms are featured in the section of INICTEL's website devoted to incubated enterprises.

social classes. Secondly, the funding would provide only the training in the use of computers. While technical know-how is certainly a valuable asset, ultimately the entrepreneurs would need to acquire the necessary equipment to implement what they have learned out of their own funds. Such financial expenses might prove more difficult for many of them to overcome than the lack of proper training. Lastly, the agreement specified that the funds were to be used for the benefit of small business owners. However, one has to ask the question how small is too small and whether it would really make sense to introduce computer technology, which is very expensive by Peruvian standards, into an enterprise with three or four employees or one that simply does not require this kind of technology. The last two points in particular lead one to wonder whether such agreements truly benefit those who they say they are meant to help or whether they only create a new kind of dependency of the developing nation on the technology from the ICT company providing the funding.

E-commerce is another large area where there have been some positive developments, but also where many more improvements are required. The obstacles to more widespread prevalence of e-commerce in Peru can be described from the point of view of the consumer as well as from the perspective of the entrepreneur who offers his/her products and services online.

As I briefly mentioned in section 2.4.3, the results of a study conducted by Apoyo Consultores in June 2002 indicated that 92% of the Internet users surveyed have never realized any kind of financial transaction online (RCP, 2003). The reasons they cited are summarized in the table below.

TABLE 2.5
Reasons given by Internet users for not purchasing goods online (2002)
Source: RCP, 2003.

Reason	Percentage of survey participants who have never realized any kind of financial transaction online
Lack of interest	29
Lack of trust	18
Does not have a credit card	13
Has not had the opportunity	10
Prefers to see and/or try out the product	10

The lack of interest reflected in the statistics can be interpreted as lack of awareness among Peru's general public as to how e-commerce functions and what kind of benefits it has to offer. Because of this lack of knowledge about e-commerce, Instituto Peruano de Comercio Electrónico (IPCE)[67] was established to promote various e-commerce projects and above all to spread information about this new way of conducting business. The institute has also contributed to the creation of several laws regulating online transactions.

Still, the lack of interest in e-commerce is not surprising given the fact that at the present moment Peruvian online vendors do not target the needs of the majority of Peruvian population. For instance, the average Peruvian who has access to the Internet only from the *cabinas* will not place an online grocery order with E.Wong. Also, the prices of products sold on Peruvian web portals are generally far more expensive than those in local stores[68] because the websites target primarily Peruvians living abroad. Neither can an average Peruvian afford to buy products from foreign websites since to the price of the product one also

[67] Trans. Peruvian Institute of Electronic Commerce.
[68] The portal of the E.Wong supermarket is an exception; the online prices are the same as those in the store.

has to add the cost of shipping and handling and the very high customs fees charged by Peruvian authorities upon delivery of the package. All in all, in order for more Peruvians to participate in e-commerce, the prices of the products available to them online should become more competitive, and the entire process of having the goods delivered should be simplified.[69]

The second reason mentioned by those reluctant to engage in e-commerce has to do with trust. Indeed, concerns over the security of online transactions are a major obstacle and are mentioned in numerous studies and surveys.[70] Peru's is still largely a cash economy, and the vast majority of the population is not used to conducting business transactions in any other way.[71] The overall lack of trust in purchasing goods over the Internet is also reflected by the fact that many Peruvians prefer to see the product or try it out before they pay for it. Apart from concerns over online payments and the quality of the products, Peruvian consumers must also worry about the lack of a reliable and secure system of having the goods delivered to them. As Thielemann (2003:118) notes, "[d]ue to poor logistical infrastructure and the high degree of corruption of the workforce, the delivery performance of the Peruvian postal service is not sufficient so that many Internet users are not willing to spend money online on an item that they might never receive."

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[69] Based on my personal experience, picking up a package sent from abroad is a very stressful and time-consuming process in Peru. International packages arriving in Lima can be picked up only from the central post office located at the outskirts of this metropolis of nine-million. After waiting one-to-two hours, the package is opened by the postal workers in the presence of the recipient, the value of the goods is assessed, and the recipient is issued a bill for the customs fees to be paid at a specified bank. Once the fees are paid, the recipient returns to the post office, waits another one to two hours, and is finally able to pick up the package sent to them from abroad.

[70] This point is mentioned by Araoz and van Ginhoven (2002), Thielemann (2003), and RCP (2003) among others.

[71] The scarcity of credit cards, for example, is one point I will address in greater detail in the following paragraph.

The lack of credit cards among Peruvians has similarly been identified as one of the main barriers to the spread of e-commerce. An obvious requirement for any kind of online transaction is the ability of the consumer to make an online payment. In the more developed countries, the most common method of online payment is credit cards. However, due to extremely strict requirements on part of the banks, only 2% of Peruvians have a credit card (Thielemann, 2003:119).[72]

As a substitute for credit cards, innovative methods of payment have been developed. Two examples are the ViaBCP card offered by Peru's Banco de Crédito and the Pagum.com card offered by Banco Wiese. Both cards can be obtained from the respective banks, and the user can deposit the desired amount of money on the card's account through automatic teller machines. Once the person goes online, the ViaBCP card can be used anywhere Visa is accepted and Pagum.com functions just like a MasterCard. Both cards are easy to use and can be obtained even if a person does not have a bank account – two important points that make these cards accessible to the vast majority of Peruvians. Yet despite the creativity shown by Peruvian banks, a more widespread use of credit cards could contribute to an even more significant growth in e-commerce. As credit card owners, online consumers would not have to pay for the goods they order beforehand, and they would also have access to a number of other benefits not provided by the substitute cards such as free insurance on the products purchased with the credit card.

From the perspective of the entrepreneurs, there are several obstacles preventing them from engaging in e-commerce more freely as well. The INEI (2001 "Indicadores") survey described in section 2.4.1 briefly mentions the main

[72] According to a survey carried out in metropolitan Lima in 2002, a staggering 67% of the respondents did not make use of any banking services whatsoever (San Román, 2002:17).

reasons that businesses cited as stopping them from offering their products and services online. They are listed in the table below.

TABLE 2.6

Reasons given by businesses for not engaging in e-commerce (2000)

Source: INEI, 2001 "Indicadores":50-51

Reason	Percentage of businesses surveyed that do not engage in e-commerce
Lack of telecommunications infrastructure	12.9
Lack of resources	14.5
Little knowledge about ICTs	14.6
Difficulties related with accessing the Internet	4.0
Other	4.4
There are no obstacles/no one opposing it	23.8

Once again, lack of awareness about ICTs in general figures prominently along with the lack of adequate infrastructure, reliable Internet access, and resources such as funds, electronic equipment, and trained personnel. However, it is interesting and worrying at the same time that in nearly 24% of the cases there were no perceived obstacles, and yet the businesses still did not show interest in e-commerce.

One government-funded agency that works towards the spread of e-commerce among the small and medium businesses involved in exports of Peruvian goods is PROMPEX.[73] Besides holding courses, forums, and workshops on the importance of e-commerce to Peruvian exporters, the agency also publishes a bilingual (English and Spanish) online catalogue of small business owners from Peru who trade in goods ranging from fishmeal to fine

[73] The PROMPEX site can be accessed at http://www.prompex.gob.pe/.

jewelry. A similar initiative created by PROMPEX is called Peru Marketplaces,[74] and it is meant to foster international e-commerce among Peruvian wholesalers and retailers abroad. PROMPEX also provides technical training and assistance to these vendors and offers them a place to advertise their goods online free of charge.

On a more general level, what Peru is lacking with respect to introducing more ICTs into the various sectors of its economy is a long-term vision and a unified national ICT strategy. At the moment, despite the existence of such organizations like INICTEL, IPCE, and PROMPEX as well as a number of smaller initiatives undertaken by individual entrepreneurs, there is no plan or policy on part of the government or any other public institution that would guide the implementation of ICTs in Peru and ensure that the process occurs in a systematic and organized manner. While spontaneous spread of these technologies and related initiatives is not necessarily negative, there exists a high risk of duplication of efforts, wasted funds, and inefficiency if such processes are not well coordinated. These are all risks that developing countries cannot afford to take given the scarcity of resources and funding available to them. On another level, the establishment of a national ICT-for-economic-development policy would also translate into a long-term financial commitment on part of the government and would hopefully ensure a stable source of funding for the various ICT programs.

Another related point is the lack of research on the effectiveness of the above mentioned institutes and the programs sponsored by them. The real impact of most initiatives, particularly those funded by the government, remains unevaluated. The compilation of reports that would critically assess the progress

[74] The Peru Marketplaces site can be found at http://www.perumarketplaces.com/.

of these initiatives on a regular basis would allow for more effective strategic planning and for targeting of specific areas most in need of modernization. However, the material being published with regard to these initiatives focuses mainly on success stories even though constructive criticism and stories of failure would be equally as valuable and could save those involved from repeating some common mistakes.

There is plenty of room for improvement in two more areas. First of all, there is a shortage of ICT programs for rural entrepreneurs since the activities of institutes such as INICTEL, IPCE, and PROMPEX are generally centralized in Lima and do not cover the more remote areas. Rural business owners have so far had to rely on their own initiative and on the help of non-governmental organizations that happened to work in their area. Yet if development in the true sense of the word is to occur, the needs of the more remote regions of Peru can no longer be ignored by the government and its agencies, particularly where technological progress is concerned. Secondly, although there have been some encouraging developments in the regulatory framework of ICTs in the economic sphere, the legislation still needs to become more extensive. For example, in 2000 three important laws regulating e-commerce were passed: law permitting electronic contracts (Law 27291), law on computer-related crimes (Law 27309), and law on digital signatures and certificates (Law 27269) (Gallegos, 2002:12-20). While the creation of these laws is commendable, it signifies only the beginning of an emerging legal framework for e-commerce. Also, while such legislation can certainly have a positive impact on the way online business is conducted, it will not bring about any significant changes unless it is strictly enforced. For instance, several Peruvian laws protect copyright and intellectual property, but in reality they exist only on paper. As for the newly created e-

commerce laws, there already have been reports of lack of their enforcement, too (Thielemann, 2003:120). Lastly, the legal framework should also be broadened to encompass other kinds of ICT-related economic activity such as telework.

2.7. Conclusion

Former Peruvian diplomat Oswaldo de Rivero (2001:2) aptly described his country at the end of the 20th century as one "that was archaically inserted in the new global economy, that was still trapped in the exporting of raw materials or slightly transformed products with non-competitive prices, that was increasingly indebted, and that had doubled its population" since the 1960s. The history of Peru's economic woes goes all the way back to colonial times and is not easy to overcome. Poverty afflicts more than half of the country's population, Peru's exports are not being modernized, and the implementation of technology to increase the country's productivity and competitiveness is slow. While Peru is making gradual economic progress, there is very little improvement in the standard of living of the general population, and the impact of positive changes is often rendered insignificant by the many socio-economic and political obstacles the country is facing.

ICTs have the potential of contributing to Peru's economic development by improving the way existing enterprises function and by creating new business opportunities for enterprises that manufacture ICTs and offer ICT-related services. Yet while some Peruvian entrepreneurs are showing a lot of initiative in adopting computer technology and the Internet to their particular needs and finding niche markets for their unique products, the implementation of these technologies is not always accompanied by changes in complementary areas. This limits the potential impact of ICTs and prevents them from truly becoming

tools for development. As authors like Edwards (2002:21) have pointed out, "[i]n order to take full advantage of this new technology, Latin American countries will have to make major investments in complementary areas, including research and development, education, and infrastructure."

In the following chapter, I will look at another essential requirement for development – widespread access to quality education. Apart from being the key to better employment opportunities, and thus a determining factor where the economic well-being of a nation is concerned, education is also closely related with improved political participation and a number of other benefits. Chapter 3 will focus on the state of the education system in Peru and on the role ICTs can play in improving it.

Chapter 3
ICTs and Education in Peru

3.1. Introduction

Apart from being a fundamental human right, education is also the foundation of sustainable development. By providing widespread access to education, a country ensures that its citizens acquire the skills necessary to face the challenges of modern times, some of which I described in the previous chapter. Literacy in particular is a basic prerequisite for full participation of individuals in the social, economic, and political life of a nation. Franko (2003:410) aptly summarizes the main reasons why now more than ever before education is of crucial importance to the developing world.

> Education raises the level of human capital, enhancing a nation's productivity. Reducing poverty rests upon upgrading basic skills as well as increasing the number of technologically sophisticated workers in the economy. A more informed citizenry is better able to participate in democratic decision making, demanding that government be accountable to the people. A better-educated populace will make more informed decisions about health and family planning, and it can participate more fully in environmentally sustainable development practices.

However, in the Third World, children are among those most affected by poverty, malnutrition, and armed conflicts. These and many other obstacles often prevent them from attending school and acquiring the basic skills they need to become successful and active members of their societies in the future. From the very beginning, the socio-economic welfare of these children is thus severely compromised. The urgency of the matter becomes clearer upon a closer look at

the exact numbers. In the Latin American and Caribbean region, for instance, half of the entire population is under the age of 16. An overwhelming 60% of these children and youths live in poverty, and only half of them will finish grade six (CIDA, 2004).

The pervasiveness of this problem in the less developed parts of the world like Latin America aggravates the region's widespread poverty and unequal income distribution. In fact, Herrera (2002:40) identifies the lack of basic education as the most important factor in Peru that puts individuals and families at risk of becoming poor, and the author hails education as the most powerful antidote to poverty (Herrera, 2002:66). In the Latin American context, education is also "the single greatest factor in explaining differing income levels" (CIDA, 2004) and the region is reported to have the world's highest education-based income differential. For families living in extreme poverty, however, education is often nothing more than an inaccessible luxury. In order to survive, parents are forced to send their children to work despite the fact that child labor severely limits the young generation's future prospects with respect to employment opportunities, potential earnings, and social mobility.

In addition to the older problems related with poverty and inequality, developing nations must now also confront the challenges of the Information Age. The young generation must be prepared for an economy that increasingly relies on technology and information and in which physical labor no longer has much value. Thus, as the demand for unskilled workers decreases and their earnings fall, enhancing a nation's human capital becomes a key concern and the importance of education grows even more. As the World Bank Group (2002:56) strategy on ICTs asserts,

> education is a crucial input into the knowledge economy. [...] Education is important because the knowledge economy is driven by both the predominance of technical skills that contribute to the economic process, and the ability to access and integrate knowledge into everyday economic activities. With knowledge being vital for the productive process, the ability to apply knowledge determines economic success.

The nature of education needs to change because the skills required of the new generation are no longer the same as two or three decades ago. As Guttman (2003:17) observes,

> [i]t is hardly surprising that every major education conference in the 1990s has called for a new or renewed vision of education, based on a profound reconsideration of the conventional model. Most experts agree that education in the twenty-first century needs to focus more sharply on the ability to communicate, to work in teams, to think critically, to adapt to change, to be innovative, creative and familiar with new technologies.

ICTs thus have a significant role to play in present-day education. Technologies such as television, computers, and the Internet can make the availability of education more widespread and can enhance its quality.

The following sections of this chapter will deal with ICTs in Peru's educational system. The focus will be on the country's primary and secondary education since these two levels attend to the needs of the vast majority of all Peruvian students. They also form the foundation for all future educational endeavors of the young generation; therefore, their quality is of utmost importance.

3.2. The potential of ICTs to improve education

ICTs have the potential to significantly improve education in two major ways. First of all, they can enhance the quality of education, and secondly, they can make access to education more widespread. Guttman (2003:26-27) explains that the

> significance of the current information revolution lies in the convergence of computer, telecommunications and audiovisual technologies, and the tremendous growth in data processing power. This convergence has facilitated new pedagogical approaches built around interactive learning. ICTs can not only present information using all possible audiovisual formats, but they can also receive information from the user. Digitalization – the storage of texts, images and sound in the same digital form on compact discs – has also opened up new frontiers for packaging and disseminating knowledge to the user.

It is a fact that a more widespread use of ICTs has facilitated access to educational services in several ways. Above all, ICTs bring more flexibility in terms of time and space to traditional education. Distance learning, also referred to as e-learning, is one fast-growing trend no longer restricted to the developing world. Technologies such as the Internet and e-mail facilitate communication between students and instructors while video-conferencing and live online broadcasts allow students to benefit from lectures given in a neighboring city or at the other end of the world. Students are now able to access course materials via e-learning platforms such as WebCT and conduct research using digital libraries. The freedom offered by the absence of a fixed class time is particularly beneficial to adult learners or students who work while pursuing their education. E-learning is not confined to a specific space, either, thus allowing educational services to reach populations in the most remote and isolated areas of a country providing they have access to the Internet.

The African Virtual University (AVU) is one of the most renowned and most successful examples of an online post-secondary institution created in the Third World and targeted specifically at the educational needs of some of the most remote regions in Africa. Created in 1997 as a pilot project funded by the World Bank, AVU operates out of 34 learning centers in 19 African countries and offers a number of degrees and diploma courses from reputable universities in

North America, Europe, and Australia. The university's main aim is to bring world-class education to African students unable to study abroad by employing such ICTs as the Internet and satellite broadcasts[75] (AVU, 2005). Another noteworthy example is the Brazilian distance education program Telecurso 2000 which prepares adults for the exams leading to a high school diploma and which is the largest initiative of its kind in Brazil.[76] It relies primarily on printed workbooks, available at a low cost at local bookstores, and televised lectures, broadcast at different times of the day and even on the weekends. The program is also starting to exploit the Internet as a potential tool. Currently, the website of Telecurso 2000[77] offers extensive information on the program, including detailed broadcast schedules, as well as many of the workbooks in Adobe pdf-format.

Apart from allowing educational services to reach some of the most remote locations and disadvantaged groups, ICTs can also enhance the quality of education, a factor equally as important as accessibility. With the help of computers, students not only develop technical skills, but their overall learning experience is enriched, too. According to Guttman (2003:34),

> technology creates a new learning environment, favouring a more interactive, collaborative, student-centred style of education that is firmly rooted in real-world contexts. Current evidence shows that ICTs enable students to learn at their own pace, engage more actively in the learning process, inquire and explore.

Computers, equipped with the appropriate software, and the Internet broaden the range of learning activities available to students. The learning experience is no

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[75] AVU describes its teaching methods as including "a blend of online and in-class learning and flexible delivery systems, combining e-learning, discussions with onsite facilitators, web-seminars and video broadcast" (AVU, 2005).

[76] As far as I know, Telecurso 2000 is the largest distance education initiative in all of South America. Claudio de Moura Castro's (2004) article offers a very good overview of the initiative.

[77] The site can be accessed at http://www.telecurso2000.org.br/.

longer restricted to the use of printed materials and teachers' lectures. ICTs also allow schools in developing nations to overcome the scarcity of other learning resources. For instance, with the help of the Internet, students gain access to books, journals, newspapers, and other publications online that would otherwise not be available to them at the local library in printed format. Increasingly, entire museum collections are digitized, thus allowing students even in the most remote villages to view them via the Internet. Considering the fact that many in developing countries cannot afford to travel, the Internet offers children from disadvantaged families a window onto their own country as well as the rest of the world. Indeed, as Guttman (2003:16) puts it, technology-driven "globalization could well provide a gateway to unprecedented opportunities for learning". Apart from all these benefits, ICTs simply make learning more fun, interesting, and motivating because activities involving computers provide a change to the usual classroom setting and workbook exercises. Students also become more actively involved in the exercises as the role of the teacher shifts from that of a lecturer to that of a guide.[78] As far as teachers are concerned, ICTs offer them opportunities to continue their education, help them stay up to date, and facilitate the exchange of experiences and materials among individual professionals and schools.

On one hand, the spread of ICTs has thus opened up new horizons where education is concerned and has put numerous new tools at the disposal of students and teachers. On the other hand, however, it has also created challenges and placed new demands on traditional educational systems, which now have the task of providing the young generation with a skill set appropriate

[78] Here I am also speaking from personal experience. I have taught in Peru at the primary and secondary levels for nearly four years and have often incorporated various computer activities into the teaching curriculum.

to the Information Age and which have to work even harder to keep up with the pace of technological developments.

Clearly, allowing students to acquire a familiarity with modern technologies from an early age could have many long-term benefits. The World Bank Group (2002:49) strategy on ICTs declares that "[t]he use of technology at the primary and secondary levels is a necessary foundation for a technologically-literate population." Edwards (2002:34) further explains the benefits of introducing students to technology at school when he states that

> [a] better technological base – including access to computers in the classroom – is likely to increase students' abilities to tackle math and science problems [among others]. And a better-trained labor force is likely to allow the country to take full advantage of new technological developments, including the Internet.

Apart from computer skills, which have become essential in today's economy, students also need to learn how to analyze, critically assess, and use the information that ICTs put at their disposal. With time, the young generations of the developing world can perhaps contribute to creating more online content reflecting their cultures and can apply computer technology and other ICTs in innovative ways appropriate to their own local context.

All in all, the impact of ICTs on education is best summarized by Guttman (2003:9) in the following way:

> These technologies are engines of growth and tools for empowerment. They offer unlimited access to information and invite a profound rethinking of the purpose of education and its relevance to national development. They have the potential to widen access to education at all levels, to overcome geographical distances, to multiply training opportunities, and to empower teachers and learners through access to information and innovative learning approaches – both in the classroom, from a distance, and in non-formal settings.

ICTs clearly hold great potential for improving education, and developing countries cannot afford to overlook the opportunities that these technologies offer.

3.3. The state of Peru's educational system

The main legislative and supervisory organ in charge of education in Peru is the Ministry of Education. The country's educational system is structured into four levels: pre-school, primary (six years), secondary (five years), and post-secondary.[79] Primary and secondary education is free, and the vast majority of schools are state-owned, i.e. public. Education in Peru is funded publicly, with the exception of private schools, which have other sources of funding[80] and which generate plenty of revenue from the high tuition fees they charge. Private schools operate primarily in larger cities, particularly Lima, and target the upper social classes that can afford to pay tuition fees frequently exceeding US$ 400 per month for each child enrolled.[81]

The diagram below illustrates that children at the primary school level form the largest group within Peru's educational system, with those enrolled in secondary education making up the second largest group. Thus, the focus of this chapter will be on primary and secondary levels of Peruvian education. Apart from having by far the largest number of students in Peru, primary and

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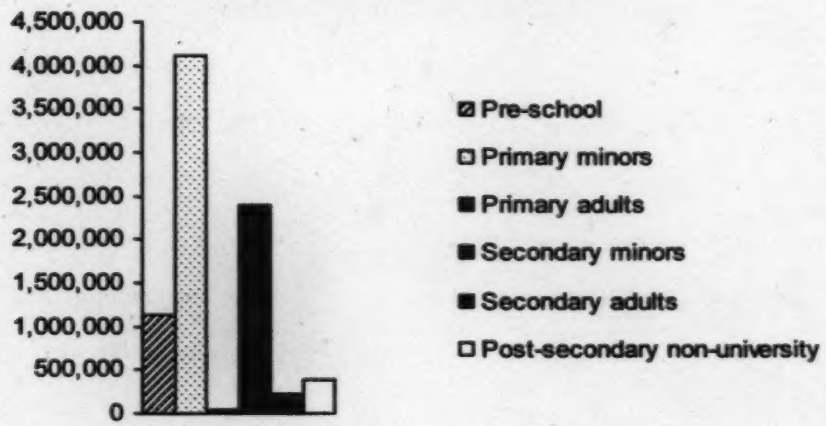
[79] Furthermore, the four levels of education are offered in two forms: *escolarizada* (schooled i.e. formal) and *no-escolarizada* (non-schooled i.e. non-formal). The first form refers to the traditional-style education received by most students at regular schools while the second form refers primarily to the education received at pre-school centers and institutes providing basic education for adult learners.

[80] Frequently, the governments of foreign countries will provide funding to some of the private schools. For example, the German school (Colegio Alexander von Humboldt) in Lima receives generous funding from the German government. This is also the case with the American, Italian, British, and French private schools, all of which receive funding from the respective governments.

[81] I can say from personal experience that at least this is the case for some of the larger and more renowned private schools in Lima.

secondary schools serve as the basis for higher education and are hence of vital importance to future employment opportunities and to the overall development of a nation.

FIGURE 3.1
Students enrolled in Peruvian schools by education level (2004)
Source: Ministerio de Educación, 2005 Estadística.



Furthermore, the division between public and private schools is quite important in the Peruvian context. Private schools have more resources and funding at their disposal and can hence afford better facilities and equipment. Also, the teachers working at private schools tend to be better trained, and the overall quality of education offered by the private institutions is higher than that provided by the poorly funded and often neglected public schools. However, as the statistics below indicate, it is the state-owned institutions that serve the needs of the vast majority of Peruvians enrolled in primary and secondary education.

TABLE 3.1
Statistics on public and private schools offering primary and secondary education (2004)

Source: Ministerio de Educación, 2005 Estadística.

	Public	Private	Total
Students enrolled in primary education	3,571,721 (86%)	592,754 (14%)	4,164,475
Students enrolled in secondary education	2,142,044 (82%)	461,047 (18%)	2,603,091
Educational facilities – primary education	28,614 (81%)	6,662 (19%)	35,276
Educational facilities – secondary education	7,228 (64%)	4,095 (36%)	11,323
Teaching staff – primary education	139,080 (75%)	46,749 (25%)	185,829
Teaching staff – secondary education	113,415 (71%)	47,421 (29%)	160,836

The problems with Peru's educational system are numerous. Latin America's educational record has frequently been characterized as dismal (Franko, 2003:410), and unfortunately, Peru is not an exception to this observation. Above all, the lack of sufficient funding seems to lie at the core of most other problems related to Peru's educational system. In developed nations like Canada and Norway, the expenditure on education in the years 1999-2001 equaled 5.2% and 6.8% of their GDP respectively. On average, Latin American countries spend slightly more than 4% of their GDP on education (Franko, 2003:414-415),[82] but in the years 1999-2001, Peru's spending on education ranked even below the regional average with a mere 3.3% of the country's GDP (UNDP, 2004 "Indicators"). Franko (2003:414) further points out that

> a smaller absolute GDP and a larger cohort of children combine to reflect lower spending per student. The United States on average spends more than $6,000 [...] per pupil on primary and secondary education [...]. The

[82] The statistics cited by Franko (2003) are based on years 1998-2000.

> dismal fact is that at the bottom of the rung [in Latin America], Guatemala, Peru, and El Salvador spend less than $250 per pupil.

Perhaps the only positive point with regard to education funding in Peru is the fact that the resources – however scarce they may be – are distributed in a fairly even way between the primary, secondary, and post-secondary levels (World Bank Group, 1994:5). This is not the case in most Latin American nations, which generally channel more funding into the universities and neglect primary and secondary education (Franko, 2003:414).

The shortage of resources and funding has a highly detrimental impact on the overall quality of the education Peruvian children receive. Public schools, especially in rural areas and poor neighborhoods, are worst affected. Rural schools nearly always face a lack of such basic materials as textbooks, notebooks, and pencils. Classes are frequently held in buildings that are desperately in need of maintenance and are taught by one single teacher expected to have enough knowledge to cover all the subjects at the primary and secondary level (Ministerio de Educación, 2005 Estadística; World Bank Group, 2001). In the poor areas of Lima and other large cities, the situation is equally appalling. As one Peruvian educator remarks about the conditions in Peru's capital,

> [s]chools are poorly equipped, often lacking such basics as books and desks, and they suffer from chaotic, crowded, dirty, and unhealthy conditions. Teachers and staff are frequently demoralized. There is crime, violence, alcohol and drugs in the surrounding environment, often among young people, age 12 or even younger, who are already disenfranchised and embittered by the system. (Wolf de Romero, 2001)

It is hence not surprising that parents often see no point in sending their children to school and prefer for them to work as child laborers and thus at least contribute to the family's meager income.

The curriculum in state-owned primary and secondary schools is not well-adapted to the demands of the Information Age, either, and it is not structured around the needs of the students (World Bank Group, 1994:5). A large number of schools lack the most basic textbooks and reading material (Ministerio de Educación, 2004:2), not to mention computers and other equipment. Given such circumstances, the quality of education in public schools depends to a large extent on teachers. However, teaching staff in Peru tends to be poorly trained, severely underpaid, and generally unmotivated and demoralized. The salary of the average teacher at a public school is usually around S/.700 (approximately US$ 215)[83] per month (World Bank Group, 2001:74.) Training of teaching staff still follows antiquated paradigms that fail to address the challenges the young generation faces nowadays. Also, while in the past Peruvian universities actually produced too many teachers, the distribution of the teaching staff throughout the country does not correspond geographically to the enrollment ratios. In other words, while there are too many teachers in the cities, there is a shortage of them in the rural areas (Ministerio de Educación, 2004:2).

To make matters worse, nearly half of all educational facilities in Peru (48%) are in urgent need of repair and improvement ("Colegios Peruanos", 2005). This means that approximately 20,000 schools do not have a roof, are constructed out of sugar cane and cardboard, have defective electrical wiring, or rely on staircases in danger of collapsing ("Colegios Peruanos", 2005). Taking into consideration all of the above factors, it becomes obvious how difficult it would be to offer Peruvian students quality education under such circumstances.

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[83] For the currency conversions I used the Universal Currency Converter available at http://www.xe.com/ucc/. The conversion was performed on May 26, 2005.

With respect to access to educational services, despite the fact that primary and secondary education is free in Peru, it is universal only theoretically. In reality, there is no equitable access to educational services, particularly where those living in rural and/or poor areas are concerned. As the table below illustrates, while enrollment in primary school is fairly universal, the numbers for rural, poor, and extremely poor children fall drastically once they reach secondary school. Furthermore, children from these groups tend to complete their primary and secondary education later than children from areas that are urban and unaffected by poverty, and they tend to receive fewer years of schooling overall.

TABLE 3.2
Statistics reflecting access to education in Peru by area of residence and poverty level (2003)

Source: Ministerio de Educación, 2005 Estadística.

	Urban	Rural	Not poor	Poor	Ext-reme poor
Net coverage of primary education (as percentage)	94.3	90.2	93.9	93.4	90.0
Net coverage of secondary education (as percentage)	80.9	52.6	83.4	71.3	47.9
Percentage of children aged 11-13 completing primary school	82.8	58.5	86.6	73.1	53.7
Percentage of youths aged 14-16 completing primary school	95.8	82.8	96.1	92.9	78.4
Percentage of youths aged 16-18 completing secondary school	64.2	24.3	68.0	45.0	17.4
Percentage of youths aged 19-21 completing secondary school	79.1	36.9	80.9	57.9	27.8
Average years of schooling received by the population aged 25-34	9.9	6.6	10.0	8.4	6.0

The reasons for the above disparities are mainly economic and related to poverty. For instance, as the principal of a school located in one of Lima's poorer districts comments, "[m]ost families must be hardworking and creative to achieve even minimum survival [...]. Many young people are simply too poor to buy even the necessary notebooks and uniform, or to take time from work to attend school" (Wolf de Romero, 2001). In rural parts of the country, which are generally far more impoverished and neglected than urban areas, the quality of education is even lower as schools frequently lack electricity, textbooks, well-trained staff, and many other resources. The students lose their motivation early on and are more likely to repeat a year and eventually drop out. For instance, as the World Bank Group's (1994:5) report on Peruvian schools points out,

> [i]lliteracy tends to be higher for women living in rural areas than for men or women living in urban areas and repetition tends to be higher among rural children living in non-Spanish speaking areas than among children living in predominantly Spanish speaking urban areas. Furthermore, the regions with the lowest indicators of educational quality (Sierra and Selva [i.e. the highlands and the jungle]) tend to have the highest proportion of uncertified teachers, the highest percentage of schools with no electricity, water or sewerage, the highest proportion of multigrade schools, and the highest proportion of illiterates.

Moreover, rural schools are often located too far away from some villages, and there is no transportation that students can use. Rural students also tend to miss more school days, particularly at harvest time or when teachers have to travel to the nearest city to pick up their salaries or take care of some administrative matters (Ministerio de Educación, 2005 Estadística; World Bank Group, 2001). Educational opportunities in Peru are also severely limited for students with special needs as well as for adult learners (Ministerio de Educación, 2004:2).

In conclusion, Peruvian educational system perpetuates the existing social inequalities and hinders equitable development by continuing to uphold the

divide between rural and urban communities and the rich and the poor population groups. Instead of challenging students to strive for excellence, Peru's schools encourage repetition and dropping out (Franko 410; Ministerio de Educación, 2005 Estadística). Low achievement among children and youth attending public schools is particularly obvious in subjects requiring strong communication and mathematical skills. There are also vast disparities in student performance depending on the area of residence and poverty level, with the rural and poor students generally performing worse than their urban and/or richer counterparts (Ministerio de Educación, 2004:2). Illiteracy is another big problem. According to statistics from 2002, 85% of Peru's population aged 15 and above was literate (UNDP, 2004 "Indicators"). While the number is high for a developing nation, it is also misleading. Indeed, in some rural administrative regions such as Ayacucho, Cajamarca, Huancavelica, and Apurímac, illiteracy affects between 27% and 37% of the population (Araoz and van Ginhoven, 2002:54).

Clearly, Peru's school system is failing those who are most disadvantaged. The low quality of primary and secondary education severely limits future educational and professional opportunities of Peruvian children. Peru's educational system is hence in desperate need of reform, and given the potential of ICTs, modern technologies could greatly enhance it in many ways.

3.4. ICTs and education in Peru

The need for change in Peru's educational system is apparent, and considering the great promise ICTs hold for education and their importance in the Information Age, computer technology and the Internet should become an indispensable part of such reforms. Several Latin American countries have acknowledged the value of these technologies early on, and they are already

reaping the benefits. The leaders in the field of ICTs-for-education are indisputably Chile and Argentina, and the positive experiences of these two countries are beginning to spread throughout the region. IIRSA's "Executive Summary" (2003:xi) notes the following:

> In countries where school connectivity is widespread, government portals to serve teachers and education have gained in importance. In Argentina, Educ.ar, and in Chile, Educarchile.cl, are exemplary, for the quality of their offerings and their popularity amongst users. The Chilean government has offered to make available the technological platform, the educational contents, the software developed by the Fundación Chile, and the necessary technical assistance, to enable Latin American countries to adapt Educar.cl's developments to their own curricular setting. The first step has been the installation of EducarEcuador.gov.ec, and a similar site is to be installed in the Dominican Republic. It is a significant collaborative effort in a matter of vital importance to the enhancement of regional competitiveness.

In most Latin American countries, however, school connectivity is low and education-related ICT programs are still in their infancy. For example, the statistics presented in Table 3.3 illustrate computer and Internet access at Peruvian primary and secondary schools.

TABLE 3.3
Statistics on computer and Internet access in Peruvian schools by area of residence, poverty level, and type of administration (2003)

Source: Ministerio de Educación, 2005 Estadística.

	Urban	Rural	Not poor	Poor	Extremely poor	Public	Private
Percentage of primary schools with at least one computer	48	2	44	7	3	8	53
Percentage of secondary schools with at least one computer	69	17	73	36	21	39	69
Number of primary students per computer	36	74	31	76	104	104	13

Number of secondary students per computer	28	46	24	46	66	57	9
Percentage of primary schools with Internet access	6	0	6	0	0	0	9
Percentage of secondary schools with Internet access	14	0	17	3	1	4	20

As could be expected, with respect to ICTs, the situation is worst at public schools located in rural and poor or extremely poor areas. Internet connectivity is virtually non-existent at schools in non-urban areas and at state-owned primary schools.[84]

Because of the lack of widespread use of ICTs in Peru's public schools, very few studies have been conducted so far on how and with what results computer technology is being used by the schools that do have access to it. Araoz and van Ginhoven (2002:50) refer to one such survey conducted by the Fundación del Consejo Nacional de Colegios Estatales.[85] From among 601 students aged between 9 and 17 who participated in the survey, 50% claimed to use the Internet to complete their assignments and 40% improved in their studies thanks to the World Wide Web. Still, studies on this topic are very rare, and the actual impact of ICTs on the performance of Peruvian students needs to be assessed in greater detail.

Computer technology has a number of benefits to offer to Peruvian teachers, too. First of all, it could facilitate in-service training and make it easier for teaching staff to stay up-to-date on current issues pertinent to their field or on administrative matters such as new legislation and memorandums frequently

[84] Despite the facts that these statistics were collected in 2003 and that the situation might have changed slightly over the last two years, there has not been any major progress in this area.
[85] Trans. Foundation of the National Council of State Schools.

issued by the Ministry of Education. Secondly, the Internet would make lessons more interesting and easier to plan. Particularly at schools in rural and isolated areas, where printed material is scarce and difficult to obtain, access to digital resources would enrich tremendously the quality of the material taught and thus enhance the overall learning experience. However, these opportunities will not be available to teachers unless the spread of ICTs proceeds at a much faster pace. Currently, teachers are no different than the majority of Peruvians that have access to computers and the Internet primarily from the *cabinas*. Only the most dedicated educators could be expected to spend part of their meager income on surfing the Web for work purposes.

Several projects that strive to equip Peruvian schools with computers and connect them to the Internet have been underway since 1996, but the vast majority of them are small-scale initiatives (Raygada Watanabe, 2001).[86] In the field of education, the most ambitious ICT program in Peru is the so called Plan Huascarán,[87] named symbolically after the country's highest peak. Created in October 2001, the plan was one of the top priorities on President Toledo's agenda when he assumed Peru's presidency. The program's objective is to improve the coverage and the quality of education in Peru by implementing more ICTs, particularly computers and the Internet, in the more neglected primary and secondary schools located in rural and urban areas of the country. Oftentimes, this goal also entails the installation of more basic services such as electricity

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[86] Among the smaller initiatives in Peru are Edured, World Links, and Globe Peru. After the creation of the Plan Huascarán, the smaller projects were partly incorporated into it (Raygada Watanabe, 2001). Several national and international NGOs are currently working towards improving literacy and increasing the access to ICTs in Peruvian schools; however, the discussion of the activities of these organizations and their impact on Peru's development exceeds the scope of my thesis.

[87] Throughout the literature on the subject, the names Proyecto Huascarán (trans. Project Huascarán) and Programa Huascarán (trans. Program Huascarán) are used interchangeably with Plan Huascarán.

and telephone lines. Technical training for the teaching staff forms an integral part of the project, too (Ministerio de Educacón, 2005 Programa Huascarán). By the year 2006, Plan Huascarán seeks to equip more than 5,000 schools with computers and connect them to the Internet, thus allowing more than 3,000,000 Peruvians from poor areas to access these technologies (RCP, 2003; Garavito Amézaga, 2002). The implementation of the plan's agenda would require a contribution of an estimated US$ 197,340,447 from the Peruvian government and an additional US$ 356,538,026 from other donors such as Microsoft and Telefónica del Perú, who have already pledged their support (Ministerio de Educacón, 2005 Programa Huascarán; Thielemann, 2003:84).

Yet while Plan Huascarán is certainly commendable for the scope of its objectives that focus on some of the most disadvantaged areas in the country, it has proved too ambitious in its early stages. The original objective was to incorporate into the plan 680 schools in the year 2002 and over 1,200 schools per year in the period from 2003 to 2006 (Thielemann, 2003:84). Nevertheless, in the year 2002 the plan equipped less than 200 new schools, a number far below the target line, with computers and Internet access (Thielemann, 2003:84).[88] More recent numbers on the progress of Plan Huascarán are difficult to find as they are not readily disclosed by the Peruvian Ministry of Education, which is supervising the project. However, it is clear from the strong criticism the plan has received in Peruvian media that this bold initiative is progressing at a far slower pace than originally predicted and is gradually turning into yet another broken promise of President Toledo's government.

[88] Sources like RCP (2003) set the number even lower and report the actual number of new schools connected in 2002 as 100.

All in all, while computer technology and the Internet have great potential of bridging the gap between Peru's urban and rural areas and improving the quality of education, access to these technologies in Peru's primary and secondary schools remains extremely low, and the implementation of ICTs is proceeding very slowly. There is also no Peruvian Internet portal targeted specifically at the needs of local students and teachers. The challenges to a wider use of ICTs in Peru's educational system are described in the section below.

3.5. Challenges

Peruvian educational system as a whole faces numerous obstacles and requires reform in several areas. Fundamental problems such as low quality of education, wide regional disparities, poor building infrastructure, and inefficient administration need urgent attention. The Ministry of Education has declared its commitment to improving the quality and equity of education in Peru through decentralization and the establishment of an education society (Ministerio de Educación, 2004:28) and has even declared a state of educational emergency. The slogan of the 2004-2006 educational campaign is "Un Perú que lee, un país que cambia"[89] (Ministerio de Educación, 2004:19), and as the words indicate, the campaign focuses on increasing literacy and communication skills among young Peruvians, which is expected to bring about positive change for the entire nation. A major point of the campaign focuses on making more reading material available to rural areas and on improving the quality of the publications distributed. Given the vast potential of the Internet to enrich traditional education by enabling both students and teachers to access digital libraries and other

[89] Trans. "A Peru that reads, a country that changes."

online publications, the incorporation of ICTs into the campaign could play a fundamental role in achieving its objectives, particularly in areas where printed material is scarce and difficult to obtain. Nevertheless, ICTs and initiatives like Plan Huascarán are not mentioned anywhere in the campaign's description (Ministerio de Educación, 2004). Indeed, there seems to be a worrying lack of consistency and a clear change of priorities where Peru's education policy is concerned. In 2001, modernization and wider implementation of ICTs in Peru's schools were a cornerstone of President Toledo's election campaign. Only three years later, the government's focus seems to have reverted to basic literacy and reading skills.

The main obstacle to more widespread introduction of ICTs in Peruvian schools is the same as the cause of most problems in Peru's educational system: lack of sufficient funding. At the moment, Peru's schools face many pressing needs. ICTs will not fix holes in the roof or patch up crumbling walls in hundreds of schools. Only four years ago, 95% of rural schools were not connected to sewer systems and more than 90% of them did not even have electricity (Thielemann, 2003:84). Thus, it should not be surprising that there is no sufficient funding for the acquisition of computer equipment and relevant software, setting up the proper infrastructure, covering the cost of Internet subscriptions, and training of the teaching staff in the use of the new technologies.

Peruvian media have frequently called initiatives like the Plan Huascarán too ambitious and too costly and have emphasized the need and urgency to revise it. One such article ("Hay que Revisar", 2003), published in the editorial section of Peru's most popular daily newspaper El Comercio del Perú, criticizes the plan for embarking on a project that is completely disproportionate to Peru's

economy where financing is concerned. Among the major faults of the plan, the article lists lack of teacher training, scarcity and low quality of the equipment, and slow delivery time of the computers. Also, many schools that have received computers are left without a connection to the Internet. Thielemann (2003:84) similarly points out the "somewhat shaky financial plan on part of the government" as a major flaw of the project.

> The government stated that they will need a total of $200 million but they never specified how exactly this money is going to be spent. Thus, it is not clarified if there will be sufficient funds not only to buy and set up computers and to install Internet connections, but also to train teachers and children how to use the computers and the Internet and also to maintain the stability of the 5,000 networks that are supposed to be set up by 2006. (Thielemann, 2003:84-85)

Plan Huascarán exemplifies what happens to many, if not most, ICT initiatives in Peru. It seems that at times, the agencies in charge of strategic planning get carried away by optimism rather than bare facts and fail to evaluate the feasibility and long-term sustainability of such projects. Thus, despite ambitious ideas, the impact of these programs remains limited, and many projects eventually fail because of insufficient funding.[90] That is not to say that ICT initiatives like Plan Huascarán are not worth starting. To the contrary, in the Information Age, such projects should be one of the pillars of education policies, particularly in the developing world. What is needed is a more realistic way of setting the objectives and working towards them. Otherwise, governments that initiate these kinds of programs run the risk of making monetary pledges they cannot cover and promises they cannot fulfill. The impact of ICTs on Peru's educational system will remain limited until initiatives like the Plan Huascarán become more than just a plan.

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[90] Thielemann (2003) briefly describes some of these failed Peruvian ICT projects throughout his work but perhaps most notably on pages 34-35 and 85.

3.6. Conclusion

Educated citizens are an asset to their country as they form a strong human capital base of the economy, are better prepared to participate in political life, and can significantly contribute to the overall socio-cultural development of a nation. Yet despite the great promise that education holds for improving Peru's dismal socio-economic situation, the country's educational system is failing to deliver quality educational services to those who most need them. With respect to ICTs, their implementation in Peruvian schools is still in its infancy. Yet it is already obvious that modern technology in Peru's educational institutions follows the general patterns of the country's educational system: its benefits remain largely restricted to the rich who reside in urban areas and attend private schools. Despite commendable initiatives like Plan Huascarán, computer technology and the Internet have so far only fostered the divide between the rich and the poor as well as between the rural and the urban areas of the country.

At the present moment, an overall reform of Peru's educational system and the way it functions appears far more pressing. It is crucial that first of all Peruvian authorities have a clear vision of where education should lead students and with what skills it should equip them. Such a vision is still absent from Peru's educational system. Declaring a state of educational emergency and substituting a new slogan for an old one are superficial steps in the right direction. Furthermore, while it is true that literacy is the basis of progress, in the technology-driven Information Age it is no longer enough to focus on basic reading and writing skills. Peru hence faces the difficult task of creating a modern and meaningful long-term vision for its educational system and a concrete action plan that will serve as a road map to achieving its objectives. Without careful planning, increased implementation of ICTs into Peru's schools is

doomed to prove a waste of the country's scarce resources because, as Guttman (2003:64) warns,

> [n]o technology can fix a bad educational policy. ICTs must be integrated into overall national education plans, which must in turn clearly establish their place within the country's educational strategy. Unless technologies are integrated into the education process, they will remain a marginal and costly accessory. A clearly articulated educational philosophy must be the "road map" for guiding investment in technology.

Economic growth and quality education that benefit the majority of population are two major pillars of development. The third one is equally important, and it has to do with a country's political system. Chapter 4 will look closer at Peru's political situation and the role ICTs have assumed under the country's current government.

Chapter 4
ICTs and Peruvian Government

4.1. Introduction

Although there exists a wide variety of political systems and forms of government, it is indisputable that the leaders of a country have a major impact on their nation's development. Heads of state, ministries, regional authorities, municipalities, local councils, and all other agencies that make up a country's government all share in the responsibility of leading their nation towards a prosperous future. Good governments serve their citizens and respond to their needs; protect rather than abuse human rights; and uphold transparency, justice, and the rule of law. However, in the developing world, more often than not such governments are an exception.

The importance of a stable political environment to a nation's development cannot be overlooked. As it is stated in one of CIDA's reports (2004),

> [w]hile development has occurred under a variety of political systems, very little sustainable development has taken place under conditions of political instability and uncertainty. Human progress and economic development can be severely depressed in environments subject to political instability. Clearly, political instability that leads to human insecurity in the form of civil war, civil unrest and human rights abuses can have devastating effects on poverty, inequality and the quality of life. Sound development requires political, governance and social institutions and structures that are predictable, dependable and robust.

Nowadays, with technology permeating nearly every aspect of our lives, governments are increasingly employing ICTs in ways that can benefit the

relationship between the state and the citizens. The following sections of this chapter are devoted to the concept of e-government and its development in the Peruvian context.

4.2. ICTs and e-governance

In much the same way as ICTs have changed the nature of business, education, and many other areas of our public and private lives, they are also transforming the way governments function. Computer technology and the Internet have opened up entirely new ways for the state to interact with citizens. Indeed, terms like electronic government (e-government), digital government, and e-governance have become commonplace,[91] and even the poorest among Third World countries have some kind of official government portal on the Internet. Yet the concept of e-government is much deeper and far more comprehensive than simply creating a national website or digitizing certain services. UNESCO (2005) defines e-governance as "the public sector's use of information and communication technologies with the aim of improving information and service delivery, encouraging citizen participation in the decision-making process and making government more accountable, transparent and effective". Some even claim that e-government is not merely a more efficient way of managing state affairs but rather an entirely new form of governance (Huaman Obregón and Martinez David, 2002) that can be broken into three major areas described in greater detail below.

First of all, ICTs enable the state to offer a wide range of services online. On numerous government websites, individual citizens as well as enterprises can

[91] These terms are used fairly interchangeably in much of the literature on ICTs and government although e-governance is at times viewed as a wider term that includes the concept of e-government (UNESCO, 2005).

obtain information, pay fees, fines, and taxes, or solicit specific certificates. The Internet also eliminates any barriers of time and place. As Huaman Obregón and Martinez David (2002) put it, the electronic delivery of state services means a government without walls, doors, or restricted hours of attention. It increases the efficiency of public administration and drastically reduces such expenses as the cost of printed forms and materials for the state and waiting times for the clients. One particularly noteworthy service offered to its citizens by the government of Brazil is electronic voting (e-voting). In fact,

> all of the votes in [Brazil's] 2002 national election were cast through an electronic system that both verified the voting process and eliminated opportunities for fraud. As a result, citizens in even the most remote areas of the country had access to the 406,746 electronic voting urns in 5,658 municipalities. (Hamilton, 2003:1)

Another way in which the state can better serve citizens is by making relevant information available online. Such information might include contact information of public offices, updates on new legislation, and the requisites for certain government procedures. As for private enterprises, online information on public procurement can often prove extremely valuable, especially given the fact that in many countries the state is the biggest buyer and contractor. Nowadays, computer technology and the Internet allow government institutions to disseminate these kinds of information more efficiently and on a wider scale than ever before.

Secondly, ICTs can improve the internal functioning of public administration. If computer technology is effectively incorporated into the operations of state institutions, it can be used to redesign, simplify, and standardize numerous processes, particularly those that are routine and have to be carried out manually. On a different level, computers can also be used to set

up networks that link not only separate agencies but entire branches of government. An Intranet, for instance, is an excellent tool that can facilitate communication among institutions. Thus, intra-governmental activities can be better coordinated and projects can be elaborated and implemented jointly. More effective internal communication speeds up the delivery of services to the public and eliminates the duplication of procedures and efforts.

The third point with respect to ICTs and governance has to do with changing the overall nature of government. As Finquelievich (2003) notes, "e-government is perceived as a means to revitalize democratic politics, decrease bureaucracy, increase governmental transparency". On the most basic level, computers and the Internet can potentially open up new spaces and forms of political participation. Citizens can communicate their views and make their voices heard by using the feedback feature, chat rooms, electronic forums, or message boards frequently incorporated into websites of government institutions. Furthermore, citizens are increasingly able to access online government documents, databases, and other publications that in the past were considered confidential. Allowing the general public to view how the national budget is allocated or how public funds are being administered can become an important instrument in the fight against corruption and can strengthen government's credibility. Free access to state documents and files also reinforces the principles of democracy as it makes the information available to all regardless of race, age, or social class.

To summarize, successful e-governance would result in a better functioning public administration, would make the decision-process more democratic and less centralized, and would lead to a closer relationship between the citizens and the state. These objectives are not easily achieved. Developing

nations often have to struggle with negative legacies of past governments that technological modernization alone will not overcome. When we examine the political history these countries, it becomes obvious that the change has to reach far deeper than just introducing more ICTs into public administration.

4.3. Peru's political situation

The roots of Peru's current political situation can be traced back to the early post-colonial period in the country's history. Independence from Spain brought neither equality nor political stability to this part of Latin America. As Simpson (1994:277) writes,

> Peru had grown out of armed revolution, her final independence involved the warring of generals, and her first civilian government did not come into existence until 1872, fifty-one years after San Martin had taken Lima and declared Peru free of Spain. It was not an auspicious beginning, nor was the subsequent history of military rule, punctuated by revolutions, a period conducive to an ordered economic and social development let alone development planning.

Peru's more recent history shows similar patterns of political instability. Changing governments and their drastic reforms have frequently brought the country close to economic ruin. In 1968, growing public discontent with economic hardships forced the military to take over. Under military rule a new set of reforms was implemented; however, in the end, they failed as well. Peru returned to democracy in 1980, but the shift did not bring any lasting improvements in the country's political or economic situation, either. Particularly the government of Alan Garcia, elected president in 1985, is remembered as one that devastated the country.

> A very large fiscal debt emerged, prices increased and inflation rose to dramatic levels (2776 per cent in 1989). Garcia's policies resulted in a fall in per capita production of 25 per cent and a reduction in the real

> minimum wage of 60 per cent between 1987 and 1990. The nation was close to bankruptcy. (Simpson, 1994:286-87)

These were also the years when Peru was struggling with yet another growing problem: terrorism. Even after gaining independence, Peru remained – as it still does today – deeply divided politically and economically. The power resided in the hands of a few rich, predominantly white landowners and mineral developers while the indigenous majority was largely excluded from wielding any kind of influence (BBC, 2005 "Country Profile"; Simpson, 1994:278). Such apparent inequalities and a dismal economic situation fuelled the guerilla movements of leftist rebels, most notably Sendero Luminoso (Shining Path) and Movimiento Revolucionario Túpac Amaru (MRTA). It is estimated that in the period between mid-1980s and early 1990s, as many as 69,000 people lost their lives as a result of the violence that ensued between government forces and the terrorist groups (BBC, 2005 "Country Profile"). The vast majority of the victims, who were frequently caught in the middle of the armed conflict and have suffered from numerous human rights abuses and vicious atrocities committed by both sides, were of indigenous origin.

In 1990, Alberto Fujimori assumed Peru's presidency and was initially admired for bringing a positive turnaround to Peru's troubled economy and virtually putting an end to terrorism. Nevertheless, Fujimori's authoritarian measures and corruption scandals led the Peruvian Congress to dismiss him on grounds of moral incapacity in November 2000 (CIA, 2005; BBC, 2005 "Country Profile"). After a brief transitory government headed by Valentin Paniagua, in July 2001, Alejandro Toledo became Peru's first self-identified indigenous leader in more than 500 years. Toledo, who as a child worked in the streets polishing shoes and later on attended Harvard University on a soccer scholarship,

embodied the hopes of Peru's impoverished and discriminated indigenous population. He gained wide popularity among the masses for openly embracing his Andean origin, vehemently criticizing the corruption of his predecessors, and solemnly pledging to eliminate poverty and create a more fair and transparent government. Yet not long after Toledo's election, the high hopes of the general public were replaced by disappointment at failed reforms, broken promises, and corruption scandals. Despite the fact that Toledo managed to remain in power until the present, his approval ratings according to recent polls are less than 10% and new scandals continue to surface (BBC, 2005 "Peru Lawmakers").

Thus, the attitude of the average Peruvian towards the government can be described as one of strong mistrust mixed with dismissal and resignation. These negative sentiments are clearly justified by Peruvian history. All in all, Peru's leaders have repeatedly neglected the needs of the less fortunate, especially the indigenous communities and the poor, have frequently abused human rights, and have done little to eliminate the endemic corruption among government officials. Corruption continues to be perhaps the largest obstacle to building a better relationship between Peru's government and its citizens. Despite the fact that the current president has officially embraced transparency, numerous scandals have shattered the credibility of his government.[92] Having had no example of an honest and just government for centuries, many Peruvians have resigned themselves to the fact that those in power will always be corrupt and abuse their positions. Others look for inspiration to the more distant past. For instance, in January 2005, some 150 right-wing militants under the leadership of Major Antauro Humala took over a police station in southern Peru

[92] Nowadays, perhaps the most common nickname of Alejandro Toledo is "Cholo mentiroso" (trans. "Lying Indian").

in an effort to force President Toledo to resign, accusing him of corruption and betraying Peru's interests. The armed rebels, who surrendered after a four-day stand-off, belonged to a group that seeks to establish "a nationalist indigenous movement modelled on the ancient Inca Empire" (BBC, 2005 "Peruvian Militants"). Such internal power struggles, along with strikes and protests, have been a common occurrence in Peru's history and, as justified as they may be, have often prevented governments from focusing their attention, efforts, and resources on development issues. With President Toledo having approximately one more year left in office, it is unlikely that any major changes will take place on Peru's political arena in the immediate future.

4.4. ICTs and government in Peru

Among Latin American nations, Brazil and Chile remain the uncontested leaders in e-government initiatives. Both countries effectively employ ICTs in public administration and offer their citizens well-developed websites that put numerous services and relevant information at the fingertips of the general public. In Peru, the first steps towards introducing e-government were taken in 2001, but the history of the initiative has been far from smooth and continuous. In fact, Reilly (2004:77-78) even refers to two separate e-government initiatives in Peru: the first one executed under the leadership of INEI and the second one managed strictly by the Presidencia del Consejo de Ministros (PCM).[93]

The origins of e-government in Peru are closely tied to the fall of the corrupt government of President Fujimori. The initiative was born during the caretaker government of Valentin Paniagua largely as a symbol of the transparency that from then on was to prevail in Peru's public administration. On

[93] Trans. Presidency of the Council of Ministers.

May 22nd, 2001, legislative decree 060-2001-PCM established the first Peruvian state portal, administered by INEI under the supervision of PCM (RCP, 2003). INEI has traditionally been the entity that dealt with issues of information technology in public administration and hence assumed the leadership of the first e-government initiative (Reilly, 2004:77). Apart from creating a state portal, INEI also established guidelines for the development of e-government summarized in the document "Política Nacional de Informática"[94] (2002).

The publication of this policy marked another important step in the introduction of e-government in Peru. For the first time, a framework for the development of projects, programs, and research in the area of ICTs and public administration was set down in print. The document clearly defined the concept of e-government in the Peruvian context and identified relevant strengths, weaknesses, and objectives to pursue. According to the policy, e-government refers to all the activities that are based on ICTs, in particular the Internet, and that the state carries out in order to increase the efficiency and competitiveness of public administration, improve the services offered to the citizens, and render the actions of the government much more transparent (INEI, 2002 "Política Nacional":17). The main objectives behind putting ICTs at the service of the Peruvian state are to modernize and decentralize public administration; to increase the efficiency and productivity of public administration, private enterprises, and individual citizens; to promote universal access to information and knowledge; and to stimulate the establishment of an information society in Peru (INEI, 2002 "Política Nacional":16). In addition, INEI's policy made several important observations and suggestions on the underlying principles and critical areas with respect to e-government in Peru.

[94] Trans. "National Policy of Informatics".

However, INEI had neither the capacity nor the authority necessary to fully implement the e-government project on all levels of public administration (Reilly, 2004:77). Reilly (2004:77-78) notes that at the time, a separate initiative of PCM, Proyecto de Gobierno Electrónico[95], was increasingly gaining importance. A division of PCM in charge of the project, Oficina Nacional de Gobierno Electrónico e Informática (ONGEI),[96] started working on an e-government strategy in the beginning of 2002, but its progress was initially hindered by unfavorable political events. Massive violent protests, a 30-day state of emergency, and changes to Peru's cabinet in June and July 2002 kept the attention of the government as well as the general public for several months that year. The lack of clarity with respect to Peru's ICT initiatives, particularly those concerning e-government, persisted until in 2003 the Inter-American Development Bank disclosed the details of a US$ 40,000,000 loan destined for a new program aimed at modernization and decentralization of the Peruvian state. The loan was to be administered by PCM, and 10% of the amount was set aside specifically for furthering the progress of e-government. That year PCM also published a new set of e-government guidelines in a document titled "Estrategia Nacional de Gobierno Electrónico".[97]

Under the leadership of Alejandro Toledo, Peru's government has consciously embraced ICTs as a tool for transforming public administration in an effort to create a state truly at the service of the people and where the functions of government institutions are decentralized in ways that favor social inclusion of all segments of Peruvian society (INEI, 2002 "Política Nacional":7, 15). There

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[95] Trans. Electronic Government Project.
[96] Trans. National Office of Electronic Government and Informatics.
[97] Trans. "National Strategy of Electronic Government". Unfortunately, I did not have access to this particular document as it has not been published online by PCM or any other government institution as far as I was able to find out.

are several important changes, resulting from an increased introduction of ICTs into the political sphere, that are currently taking place in Peru. Once again, they can be roughly divided into three major categories: the quality and accessibility of government services and information, the internal functioning of public administration, and the changes in the relationship between Peruvian government and its citizens.

Already Peru's very first national policy on e-government (INEI, 2002 "Política Nacional") recognized the many benefits of digitizing services offered by the state and called for a more client-oriented way of serving the public. According to the document, the first step for the state would be to replace the idea of citizens approaching government institutions to solicit services with the model of a state that is in permanent communication with its citizens and effectively serves them with the help of modern ICTs (INEI, 2002 "Política Nacional":19). By focusing more closely on the needs of the clients, i.e. individual citizens and enterprises, and shifting to the electronic form of management, the government would be able to reduce the cost of many services as well as decentralize and democratize access to them. Sometimes, certain processes could be eliminated altogether (INEI, 2002 "Política Nacional":14). The ability to access government services and official information online would be particularly valuable to those living in Peru's rural or isolated areas where there are no government offices and people spend plenty of time and money traveling to a nearby town to pay their taxes or obtain some information.

Currently, Peru's central state portal[96] is divided into three major sections. The first one offers detailed information on the most common procedures such as soliciting a driver's license, an identity card, a passport, or certain certificates.

[96] The portal can be accessed at http://www.peru.gob.pe/.

The site does not allow a person to apply for these documents online but rather describes the application process, cost, location and hours of the government office in charge, as well as the estimated waiting time required to complete the procedure. The second section of the portal claims to offer individuals and enterprises approximately 300 online services. In reality, however, this part of the website enables clients mainly to realize some simple online inquiries and to access databases and information on particular issues. Thus, while the portal offers numerous useful links, it does not allow clients to carry out the actual procedures online. The last section consists of a comprehensive state directory featuring contact information for all government institutions along with links to their websites, where available. The directory includes all ministries, regional and local governments, councils, commissions, and other minor public entities. Apart from these three main sections, the government also uses the portal to keep citizens informed on the progress of some major projects and campaigns, current events, the latest initiatives being proposed, and new laws and regulations being passed.

All in all, while Peru's state portal is very well organized and easy to navigate, it is still in the phase of offering information rather than actual services. As a source of information, the website is very valuable. It allows Peruvians to realize online inquiries and find answers to questions on topics ranging from health to investment opportunities. There is even an entire section on Peru in English, providing the prospective tourist or investor with some basic information about the country and with additional links of interest. Nevertheless, Peru's state portal and other government websites still offer very little interactivity where the execution of actual procedures is concerned.

One important area related to information services that Peru is working to improve is electronic procurement (e-procurement). As Drosdoff (2002:1) notes, "[g]iven that public procurement in Peru totals $5 billion per year and is the largest single source of contracting, it is critical for small businesses to compete effectively with larger companies in this sector." Yet Peru's former Prime Minister Roberto Dañino once himself admitted, "Now procedures are so complicated a small business could not even sell a pencil to the government" (Drosdoff, 2002:1). The Internet offers the potential of making information on government contracts transparent and accessible to all – an important factor in a country plagued by corruption. The digitalization of the public procurement process would make it easy for enterprises, particularly small businesses, to compete on government contracts in an environment of fairness and equality. Currently, efforts are being made in the area of e-procurement, but – as is the case with most state services in Peru – so far the procedure cannot be fully completed online.

Online services are only the first of the three major components of e-government. The second area where computer technology and the Internet are highly relevant to the overall modernization of the Peruvian state is the internal functioning of public administration.

In Peru, there are nearly 3,000 government institutions that can be grouped as shown in Table 4.1.

TABLE 4.1
Structure of Peru's public administration
Source: INEI, 2002 "IV Encuesta":13-14.

Peru's public administration	Number of institutions
Central government – executive branch	754
Central government – legislative branch	1
Central government – judiciary branch	18
Regional governments (territories)	283
Local governments (provincial, municipal)	1,828
Autonomous entities (eg. universities)	88
Total	2,972

The largest and most recent survey on the use of ICTs in Peru's public administration was carried out by INEI in September 2001 – April 2002. "IV Encuesta Nacional de Recursos Informáticos y Tecnológicos de la Administración Publica"[99] (INEI, 2002) focused on the use of computer technology by institutions at all levels of Peruvian government.[100] One of the more striking facts revealed by the survey was that a mere 31.3% of all public employees had access to a computer and only 14.3% had access to the Internet (INEI, 2002 "IV Encuesta":89). Other selected findings are summarized in Table 4.2. The statistics reflect a degree of ICT use in Peru's government institutions that could perhaps be deemed as satisfactory for a developing country but not for a nation that consciously seeks to modernize its public administration.

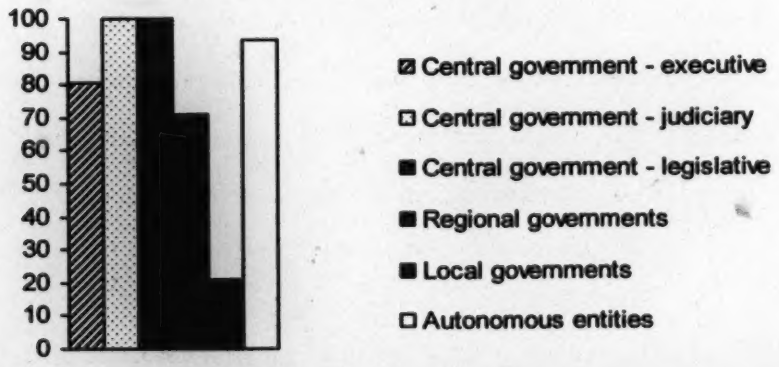
[99] Trans. "Fourth National Survey of Informatics and Technological Resources in Public Administration". Currently, fifth survey of this kind is being carried out by PCM. For details on the new survey, refer to http://www.pcm.gob.pe/v-enriap/v-enriap.htm.
[100] The survey was distributed to a total of 2,972 government institutions representing the entire public administration of Peru. Response was received from 1,389 of them, but only 1,026 completed questionnaires could be processed due to insufficient information or a total lack of computer resources at some institutions. Still, the findings of the survey were considered by INEI as sufficiently representative of the state of these resources in Peru's public administration (INEI, 2002 "IV Encuesta":12).

TABLE 4.2
Selected statistics on ICTs in Peru's public administration
Source: INEI, 2002 "IV Encuesta":15, 77, 85, 97, 111, 117.

Percentage of government institutions that...	
are connected to some kind of information network	51.8
have access to the Internet	59.6
have access to an Intranet	43.3
make use of SIGA[101]	14.1
have some kind of security measures when processing information digitally	59.1
have a strategic plan with respect to ICTs	13.0

Concerning the use of the Internet, the vast majority of central government institutions and regional government offices indicated that they did have an Internet connection.[102] However, in the case of local governments, only 20.9% of them had access to the Internet (INEI, 2002 "IV Encuesta":77-78).

FIGURE 4.1
Percentage of Peru's public institutions with access to the Internet
Source: INEI, 2002 "IV Encuesta":78.



[101] The acronym SIGA stands for Sistema Integrado de Gestión Administrativa (trans. Integrated System of Administrative Management). It is a computer application designed especially for government institutions in an effort to increase their productivity and maximize their efficiency in areas such as accounting, human resources, treasury, or supplies (INEI, 2002 "IV Encuesta":97).
[102] For detailed numbers, refer to Table 4.4.

In the institutions that reported to the have online access, the Internet was used primarily for information searches as Table 4.3 illustrates. In fact, it appears that Peru's public administration perceives the Internet largely as a tool for finding and diffusing information. Only a mere 3.4% of public entities reported to take advantage of the more interactive capabilities the Internet has to offer such as conducting online conferences.

TABLE 4.3
The use of the Internet by Peru's government institutions
Source: INEI, 2002 "IV Encuesta":81.

How the Internet is used	Percentage of institutions
Information searches	91.7
Institutional information inquiries	69.2
Information diffusion	51.7
Electronic transactions	20.1
Provision of services to the public	17.8
Online conferencing	3.4
Other	0.8

One interesting point about the results above is that using e-mail was not specified as a separate category. It is possible that it was included in one of the other categories even though the survey makes no mention of it. Another, perhaps less probable, explanation could be that e-mail is still not a significant means of communication in public administration.

It is important to point out that with nearly all the statistics, the numbers tended to be higher than the overall average for institutions of the central government and significantly lower than the average for local governments. Low connectivity and lack of technological resources at the lowest level of Peruvian government is a major problem area. While local governments constitute the

largest group in Peru's public administration, it is unfortunate that only 25.4% of them actually responded to the survey (INEI, 2002 "IV Encuesta":14). Yet from the answers of the 464 local governments that participated in the study, it is clear that these entities are the poorest and worst-equipped when it comes to computers and Internet access. Such a situation creates a serious problem for the entire public administration since the provincial and municipal governments are of crucial importance for a number of reasons.

> Local governments are close to citizens, and constitute for many the main representation of government. The relationship of citizens and local authorities tends to be one based on proximity as the interests at stake for both parties are clearly entwined concerning issues such as public services, urban development, education, public transport, environmental concerns and local politics. It is at the local level that the impact of ICTs on the relationship between governments and citizens can be most effective. (UNESCO, 2005)

Thus, if the Peruvian government is truly committed to modernizing its public administration, the local governments would be the most logical point to start doing so.

Lastly, e-government initiatives are generally viewed as a way to make governments more transparent and accountable by employing ICTs in order to establish a more horizontal and open relationship between the state and the citizens. For Peru, transparency became a core issue in public administration after the fall of President Fujimori's corrupt government and was the main reason behind the original e-government initiative. Thus, transparency figures prominently in the Peruvian definition of e-government as well as on numerous government websites. Peruvian ministries and other public entities now offer free access to statistics and databases on a variety of topics. Particularly noteworthy is the website http://transparencia-economica.mef.gob.pe/. It is sponsored by the Peruvian Ministry of Economy and Finance and is devoted entirely to providing

information on economic issues such as management of public funds. Furthermore, all ministries and major government institutions currently offer clients the ability to contact them by e-mail, and some of them even maintain open forums on specific topics.[103]

To summarize, in Peru there are many hopes and expectations associated with the development of the Peruvian e-government initiative, and Peru's leaders have been making conscious efforts to make public administration more client-oriented, efficient, and transparent with the help of ICTs. However, many challenges remain to be overcome. The most prominent barriers to progress will be the focus of the following section.

4.5. Challenges

Peru has several major obstacles to overcome on the way to the successful implementation of e-government. The challenges have different root causes, and for most of them, their resolution also depends on whether or not certain other aspects of Peru's political culture will be sufficiently reformed.

In the area of provision of state services to the general public, the main flaw is the fact that the services are not fully executable via the Internet. Although most of them could easily be digitized and carried out entirely or nearly entirely online (INEI, 2002 "Política Nacional":14), Peruvian government institutions still do not take advantage of these potential capabilities of modern technologies. In the case of transactions involving a payment (eg. of fines, taxes, customs fees, etc.), there is frequently a lack of means to complete the transaction since the use of credit cards is minimal in Peru, and concerns over

[103] For example the website of Peru's Ministry of Education has a special forum for teachers with ongoing discussions on a variety of topics. For more information, refer to http://www.ciberdocencia.gob.pe/forum/.

privacy and security of information are a serious issue as well. Thus, the services that Peruvians have access to online are informational rather than truly interactive in nature.

On the other hand, provision of information can be a valuable service itself. Indeed, timely access to accurate and reliable data, news, or statistics published by the government is important for both citizens and enterprises. A brief survey administered online by INEI in March 2001 clearly showed that this sort of information is important to Peruvians. In response to number of questions as to what kind of services Peruvians would like the state to offer on the Internet, the vast majority indicated that they would like to have more access to statistical and bibliographical information as well as to information on general issues such as scholarships and other opportunities. In fact, having access to this kind of information was mentioned by the respondents more frequently than the demand for basic government services that could be fully carried out online (INEI, 2001 "Encuesta de Opinión").

Yet in this area too the Peruvian state is lagging behind. While all ministries and a large number of other government organs currently have a website, many sites are not regularly updated and do not contain sufficient information about online services (INEI, 2002 "Política Nacional":10). For instance, in 2000, 71% of the institutions actually had a website, but only 29% of those who had one updated its contents on a regular basis and only 21% had a search feature built into it to help users find specific information on the site (INEI, 2001 "Estudios de Páginas Web":6). Furthermore, only 25% offered access to

institutional statistics and a mere 4% had a FAQ section (INEI, 2001 "Estudios de Páginas Web":10-11).[104]

Another point that should be mentioned is the overall design of Peruvian government portals. If a website is truly meant to serve the needs of the average citizen, it must be clearly designed and easy to navigate. It should not only provide relevant information but also offer it in a user-friendly and customer-oriented way. The design should make it clear that the user is in fact visiting an official government website and should facilitate the task of finding specific information. Thus, the way information is presented to clients should be standardized by employing the same layout, fonts, symbols, and perhaps even colors throughout all official state websites.[105] Nevertheless, user-friendliness and consistency of design are precisely the characteristics that are absent from the design of public administration websites in Peru. Every single ministry and state institution with an online presence seems to have its own unique layout and color scheme. The only common features among all the websites seem to be an overload of flashing graphics and a large number of broken links. Furthermore, the portals still offer very little in terms of access for disabled people and members of indigenous communities that do not speak Spanish. Surprisingly, even the websites of small townships with predominantly indigenous populations are available exclusively in Spanish.[106] Most of the websites are not translated

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[104] This particular survey, also conducted by INEI, examined a sample of 188 public administration websites. While the precise statistics are likely to be outdated by now, given the extremely slow of pace of technological progress in Peru and my personal familiarity with Peruvian websites, I would say that the main points the study makes are still valid.

[105] This is the case with all the websites of Canada's federal government, for example.

[106] One such website is that of the Pazos district available at http://ertic.inictel.net/pazos/. I have had the opportunity to visit the town of Pazos in 2002. The only language I have heard spoken on the streets of the town was Quechua; Spanish was the language used solely for educational and administrative purposes. Hence, while it is not surprising that the website of Pazos be offered exclusively in Spanish, it clearly does not target the

into foreign languages like English or French either, thus making government information and statistics featured on them virtually inaccessible to non-Spanish speakers. One other detriment is the fact that the vast majority of Peru's state websites load very slowly. This is important considering that most Peruvians do not have a broadband connection to the Internet. The large number of flashing elements and animated banners on these websites increase the loading time even further. It is easy to imagine how all these factors taken together can easily lead to frustration among the users and can discourage them from using government websites in the future.

The use of ICTs in Peru's public administration similarly requires plenty of improvements. The way Peruvian government operates remains excessively centralized, leading to administrative bottlenecks, long service processing times, and high procedure costs (INEI, 2002 "Política Nacional":15). Computer technology and the Internet could clearly benefit Peru's state institutions in more than one way. Yet it seems that until now, ICTs have had very little impact on the internal operations of the country's public administration.

One significant problem lies in the fact that the technological resources available to Peru's state institutions are limited, outdated, and not sufficiently taken advantage of. First of all, the relatively low use of computers and the Internet in the country's public administration is apparent from the statistics mentioned in the previous section of this chapter. The situation becomes even worse when the percentage of institutions that report having access to the Internet is compared with the actual number of employees with access to this tool. As the table below illustrates, even if an institution does have an Internet

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needs of the local population and neither does it reflect the true identity of the district. Personally, I find it disappointing that only a very small number of indigenous languages find their way onto the Internet.

connection, it does not mean that all the employees that work there have access to it. Indeed, even in the case of the judiciary branch of Peru's central government, whose institutions are all connected to the Internet, only 28.1% of employees have access to this technology.

TABLE 4.4
Access to the Internet in Peru's public administration
Source: INEI, 2002 "IV Encuesta":78, 92-93.

Type of Institution	Percentage of institutions with access to the Internet	Percentage of employees with access to the Internet
Central government – executive branch	80.8	12
Central government – legislative branch	100	55.9
Central government – judiciary branch	100	28.1
Regional governments (territories)	70.8	13.3
Local governments (provincial, municipal)	20.9	8.9

Secondly, even though certain sectors of Peru's public administration are very well equipped with computers, the hardware tends to be quite old, thus limiting the type of tasks and activities the equipment can be used for. According to INEI's survey, only 25.4% of all public institutions were using Pentium III or Pentium IV computer processors. The rest were using computers with far older processing technology (INEI, 2002 "IV Encuesta":127-28).[107] As for Internet use, the most frequently utilized bandwidth was only 64 Kbps (INEI, 2002 "IV Encuesta":79). Aside from the problem of outdated equipment, a large part of the technical personnel employed in public administration has little knowledge of the latest technologies or has had no formal technical education or training at all

[107] The exact breakdown was as follows: 0.7% of institutions used Pentium IV computers; 24.8% used Pentium III; 29% used Pentium II; 32.8% used Pentium; and 12.7% used 486 computers (INEI, 2002 "IV Encuesta":127-28).

(INEI, 2002 "Política Nacional":15). This means that the computer equipment is not only old but possibly poorly maintained, too. Overall, despite the declared commitment of Peru's leaders to the modernization of state administration, on the institutional level ICTs are still viewed as a non-essential expense that can be put off until a more opportune moment and are not considered a priority in the budget of public administration (INEI, 2002 "Política Nacional":15).

Thirdly, as I have already pointed out in the previous section, Peru's public institutions still do not fully take advantage of the potential benefits that computer technology and the Internet have to offer but rather utilize them for information searches more often than for other tasks. Networking, e-mail, online videoconferencing, and other useful tools remain underutilized among Peru's state institutions. Neither is there any evidence that processes are being standardized, simplified, or even eliminated with the help of ICTs.

Another problem at a higher level is the lack of coordinated planning. It is ironic that while public administration is highly centralized in Peru, the efforts towards modernizing it are not. The responsibilities with respect to ICTs in public administration are shared among several state institutions and are not always clear (INEI, 2002 "Política Nacional":15). There is no coordinated effort towards achieving one common objective. To the contrary, every major government institution is in charge of developing its own ICT strategy and proposing a specific ICT budget to be approved by central government (INEI, 2002 "Planes Operativos"). Yet according to the INEI survey, by the end of 2002 only 13% of government institutions had a strategic plan for the implementation of ICTs, particularly computers and Internet access (INEI, 2002 "IV Encuesta":111). The implementation of e-government in Peru is hence not being executed as one single project with clear objectives and under unified leadership but instead

consists of a number of separate initiatives. Such a situation leads to lack of coordination, the absence of a clear sense of direction, frequent duplication of efforts, and thus waste of scarce resources and time.

Apart from changing the nature of public administration in tangible ways, the objectives of e-government initiatives usually go further than just digitizing certain services or making government institutions more efficient. The larger objectives are generally associated with employing ICTs to bring citizens closer to their leaders, provide the general population with universally accessible information on issues of importance, and make governments more transparent, democratic, and accountable. In this respect, the way an average Peruvian perceives the government forms perhaps one of the major obstacles to effective establishment of e-government in Peru. Persistent corruption, scandals, and failed reforms have had a profoundly negative impact on the attitudes of Peru's citizens towards their leaders. The strong sentiment of mistrust directed towards the authorities and harbored by the vast majority of Peruvians will not be erased by going digital. The e-government initiative is certainly a worthwhile step. Yet the actions of political leaders in real life speak much louder than the image that Peru's government strives to portray online. Going digital should not be used by the government as a substitute for deeper reforms of the system and of the entire political culture but rather should accompany them.

A related factor that is frequently mentioned in discussions of e-government initiatives is the concern over how easily ICTs can be turned into tools of surveillance. In Peru, government surveillance is still a sensitive subject. During the 10 years President Fujimori was in power, Peru's intelligence agency, headed by Vladimiro Montesinos, became an instrument of terror as it regularly spied on and blackmailed figures that were famous, influential, or simply deemed

as too outspoken. Advanced spy-cameras and secret video recordings were the favorite technologies used to carry out the spying. Nowadays, similar fears are voiced over modern ICTs, and they apply to the practices of authoritarian as well as democratic governments. For instance, Ramonet (2004) cites as a cause for concern

> the control of the internet by authoritarian regimes, including China, and the policing of private lives, via surveillance and monitoring of internet activities, in many democratic countries, including the United States, under the pretext of the struggle against terrorism. Citing cyber-security, governments [a]re unwilling to make concessions.

On the other hand, some of the popular beliefs related with open access to information disseminated by governments are flawed, too. For example, the notion that a better informed population will be able to make better political choices and cause governments to become more transparent and accountable rests primarily on the assumption that the citizens first of all, have access to reliable information, and secondly, know how to interpret it. However, oftentimes it is difficult to discern credible quality information from useless, biased, or untrue reports. This is clearly a danger with regard to the information that can be found on the World Wide Web. Indeed, the Web has frequently been criticized for providing too much low quality information. According to Balsamo (1996:346), many of the myths of the Information Age "serve[...] to focus attention on the *amount* of information and to deflect attention from questions about the *kind* and the *quality* of information disseminated through new communication technologies." The author further points out that the

> question that remains to be addressed is: how (exactly) does access to greater amounts of information enable people to act in socially responsible ways such that desirable social changes are enacted. It seems just as likely that such access could be counterproductive, disabling and overwhelming to a person's ability to discern important information and act accordingly. (Balsamo, 1996:346)

Hence, more information will not automatically create a more politically aware society as the average citizen may often not posses the necessary background knowledge to interpret and assess the issues being debated in an intelligent and constructive way. Neither will the fact of being informed by itself mobilize the population and make it more politically active and involved.

Yet another side of the issue has to do with the nature of the information being disseminated online by governments. As some have noted,

> [i]]nformation and the means for its dissemination represent power. Accordingly, political structures where governments still see knowledge as a threat are unlikely to relinquish their control over basic means of communication. In the recent past, military regimes in Latin America and Africa and the apartheid system in South Africa saw the free flow of information through traditional telecommunication technologies as one of the major menaces to their stability. In countries where democratic states are weak or have collapsed, the democratic potential of these technologies is even less clear. Today, countries like China, Vietnam and Singapore are already taking steps, through legislation, to control the unbridled expansion of ICTs in their societies. These and other similar measures undermine the democratic potential of ICTs. (Morales-Gómez and Melesse, 1998:7)

In fact, a report by the organization Privacy International (2003) found that "censorship of the Internet is commonplace in most regions of the world" and it is only the extent of restrictions that varies. The report further observes that such "[c]ontrol and censorship has a substantial effect on the Internet because it undermines confidence and trust in the medium and inhibits crucial flows of data". Although censorship of Internet content is virtually non-existent in Peru at the present moment, the situation might change in the future, depending on the country's political circumstances.

All in all, the kind of information users have access to on the Internet is not entirely free of all restrictions. A lot depends on the type of government that

disseminates the information and controls the access to it. This fact has led authors like Balsamo (1996:346) to argue along similar lines that

> the myth of technologically assisted democracy obscures the process whereby choices are constructed for people. Whereas the guiding myth of the information age proclaims that citizens have access to all the information they need, what is rarely discussed is the mechanism whereby information is encoded, manipulated, packaged and selectively disseminated. In short, we often fail to appreciate how our 'choices' are already constructed for us by the kind of the information made technologically available.

Thus, while there is certainly a lot of value in having important information available at our fingertips, we should never blindly accept what we read online, particularly where political issues are concerned.

Lastly, an additional challenge to e-government is presented by the low connectivity, especially in rural and poor areas, that limits the access to services and information among those who already have the least access to them. Unless all of Peru's citizens – regardless of their race, social class, and the area they inhabit – have fairly universal access to computer technology and the Internet, the objectives of the e-government initiative will not be fully achieved. If free access to ICTs remains a privilege at the disposal of a select few, the e-government initiative will only benefit the rich minority and perpetuate even further the gap between the powerful and the powerless.

4.6. Conclusion

A healthy political environment is one of the most basic prerequisites for sustainable development of a nation. As Howkins and Valantin (1997:10) note, "[t]he political process can enable or inhibit development. The importance of good government and appropriate democratic institutions to articulate social goals cannot be over-emphasized." ICTs have a significant role to play in

changing the nature of communication and interaction between the government and the citizens, decreasing bureaucracy, and strengthening the principles of transparency and democracy by facilitating free access to information for all.

In the case of Peru, despite its low popularity, President Toledo's government should be credited for making the first major attempt at modernizing the state and Peru's public administration with the help of ICTs. At the same time, it is crucial to keep in mind that while an increased implementation and use of computer technology along with the creation of a state portal are certainly steps taken in the right direction, they should remain neither the only nor the main ways of attempting to make the government more efficient, participatory, democratic, and transparent. After decades of living under corrupt and often violent regimes, Peruvians have lost trust in their leaders. It will take much more to rebuild that trust than just making some government information accessible online. Changing the government's image must first and foremost be rooted in a change from within and not merely be limited to a change in the way the state presents itself. This in turn requires a complete transformation of the mentality of those in power and of the way public administration functions in Peru.

For the time being, Peru's e-government initiative is far from becoming a new form of governance. Despite the fact that technological modernization of the Peruvian state is indispensable for sustained and competitive development of the nation (INEI, 2002 "Política Nacional":17), the efforts of government institutions remain fragmented. The services offered to clients online are still not fully executable online, and the public institutions either lack ICT resources or do not sufficiently take advantage of them. It is clear that more sustained investment, careful planning, and changes to the way Peru's public administration functions are necessary if the objectives of Peru's e-government project are to be

achieved. Also, more studies that monitor and critically assess the progress as well as the success and popularity of e-government in Peru would be highly useful at this point in time. Most of the studies and surveys I referred to in this chapter were conducted in the years 2000-2002 and are thus becoming outdated. Currently, "V Encuesta Nacional de Recursos Informáticos y Tecnológicos de la Administración Publica"[108] is being carried out by the PCM. It will be interesting to see whether the survey reveals any significant changes in the use of computer technology in the area of public administration. So far, there are also no published statistics on how many clients have made use of government services online and what they thought of the process. Only with the help of more research and deeper insights into such issues can further improvements to Peru's e-government initiative truly serve the needs of citizens and the nation at large.

[108] Trans. "Fifth National Survey of Informatics and Technological Resources in Public Administration".

Chapter 5
Conclusion

5.1. Review of research

Several important thoughts emerge out of the previous chapters. First and foremost, development is a complex process and there is no simple recipe for it. Its complexity is due largely to the fact that all the different spheres addressed in this thesis – economic, social, and political – are intimately intertwined and do not function independently. For instance, economic growth can raise the overall standard of living and provide the state with more funds to invest in education, health care, and development programs. Literacy and education in turn have always been essential to a nation's progress since they can decrease the risk of becoming poor and strengthen the human capital base of a nation's economy. Especially in the Information Age, education has become a crucial element in the ever more globalized knowledge economy. Outside the economic realm, education also equips individuals with the skills necessary to participate fully in the social and political life of a nation, to make better decisions as individuals and citizens, and to keep political leaders more accountable. Political stability, on the other hand, ensures a favorable environment for socio-economic development. These are just a few examples of the strong interdependence that exists between society, economy, and politics.

Similarly, while the link between ICTs and development certainly exists, it is not a straightforward causal relationship. The introduction of ICTs does not

occur in a vacuum. Hence, the effectiveness of these technologies and the benefits they have to offer are highly dependent on the implementation of complementary social, economic, and political reforms. This point is particularly important in a developing country like Peru which is struggling to overcome the challenges of a violent past, rampant corruption, widespread poverty, vast socio-economic inequalities, and a generally low standard of living.

I have started out by proposing the hypothesis that in Peru access to modern technology is closely related to power as well as opportunities for progress and development. The results of my research largely confirm this hypothesis. The spread of computer technology and the Internet in this corner of Latin America has in many ways mirrored Peruvian reality. As Thielemann (2003:v) asserts, "Peru is a very centralistic country, with great social differences and an extremely multifarious society structure. Accordingly, the development of the Internet in Peru is not linear and straightforward but rather heterogeneous, with multiple facets and unique features". In Peru, the use of ICTs is still centralized in the larger cities, particularly Lima, and it is generally the richer and more influential groups of society that have the most access to computer technology and the Internet. Rural and geographically isolated areas of the country remain neglected with respect to technological development; the same is true for the shanty towns and the poorer districts of urban centers. This digital divide between the rich and poor on one hand and the rural and the urban populations on the other is visible in private enterprises as well as at educational facilities and in government institutions.

Peru's first national policy on informatics ambitiously declared that information technologies should decidedly reaffirm values and national identity, strengthen democracy as a form of government, support the development of all

cultures that exist on Peruvian territory, decrease poverty, and minimize the digital gap that still persists nowadays, thus generating capacities and potentials for the sake of an integral development of the population at large and of the national economy (INEI, 2002 "Política Nacional":6). However, until now there is little evidence that ICTs in Peru are being consciously employed in accordance with the above guidelines. Despite the fact that *cabinas públicas* have made the Internet popular even in the most remote corners of the country and have liberalized access to this new technology, the Net remains for Peruvians largely another consumption item to be used primarily for entertainment and simple communication purposes. Consequently, while the Internet is enormously popular among individuals, especially the young generation (RCP, 2003), its potential as a tool for development is still not sufficiently harnessed on the larger societal level. As Finquelievich (2003) wisely remarks, "[t]he global reach of Internet gives individuals an unparalleled degree of access to people, resources, and experiences. However, all this potential will amount to little, if people use technology just as a consumption item, instead than as productivity tool."

From an economic standpoint, ICTs have not yet achieved the critical mass necessary to make a noticeable difference in the competitiveness, productivity, and efficiency of Peruvian businesses and the country's economy in general. A national ICT industry in Peru is virtually non-existent, and the government has until now made no efforts to stimulate its development. Thus, the country remains a consumer rather than a producer of ICTs. Even as a consumer, Peru does not acquire these technologies on a large scale, and the degree of penetration and use of computers and the Internet in the various sectors of Peruvian economy remains low. Medium and large-size companies make moderate use of these ICTs. Rural and small entrepreneurs often show

plenty of initiative and creativity in adopting ICTs to their own needs, but most of the time small businesses lack the initial capital and other resources required for acquiring the equipment and launching major ICT ventures. One interesting exception is the case of *cabinas públicas*. Their rapid spread throughout Peru attests to the interest of Peruvians in computer technology and the Internet. Furthermore, the success of the *cabinas* has shown that in the present-day environment, even among the least privileged groups in developing countries ICTs are in such high demand that small-scale ICT enterprises targeting the needs of the poor and rural populations can indeed be very profitable, too. E-commerce and telework are two other potentially lucrative business opportunities created by ICTs that remain underdeveloped in Peru and illustrate the many changes that need to take place on different levels before Peruvians can begin to take full advantage of the benefits computer technology and the Internet have to offer.[109] Currently, there are no large-scale government initiatives geared towards increasing the awareness of what ICTs can do for Peru's businesses or towards strengthening the efforts to implement these technologies throughout all economic sectors. Neither is there any evidence that ICTs in Peru are being used in ways that support wider economic reforms and organizational changes.

In the field of education, the gap between the rich and the poor with respect to access to computer technology and the Internet is much more apparent than in the spheres of economy or politics. The children whose families can afford to send them to private schools and who generally inhabit urban areas and belong to the upper social classes, have plenty of access to ICTs in their educational facilities. However, at the schools located in rural and poor areas, technological resources are either extremely scarce or non-existent. The

[109] The challenges to e-commerce and telework were addressed in section 2.6.

situation is worst at state-owned primary and secondary schools. Taking into consideration the fact that the vast majority of young Peruvians attend public schools, it can be said that generally, access to computer technology and the Internet among Peruvian students remains severely limited and is highly dependent on the child's socio-economic background and place of residence. Hence, ICTs in Peru have so far failed to contribute to improving the quality of education or to increasing access to educational services.

The scarcity of technological resources in Peruvian schools is not surprising given the dismal state of the country's education system and the pressing demand for fundamental reforms in the way it operates. In the past, little has been done to remedy students' low achievement and the high repetition and drop-out rates. The overall system is characterized by a constant lack of funds and resources, crumbling infrastructure, and teaching staff that is underpaid, unmotivated, and not sufficiently trained. In this context, ICTs might in fact seem like a superfluous luxury. Yet the absence of ICTs in the majority of Peru's primary and secondary schools is a serious problem because it means that young Peruvians are not acquiring technological literacy, which plays an increasingly crucial role in today's knowledge economy, and are not being adequately equipped with the skills necessary to meet the challenges of the Information Age. Plan Huascarán remains the most ambitious government initiative in the field of ICTs and Peruvian education. While the initiative should be commended for attempting to centralize the efforts to introduce more computer technology and Internet access in public schools, particularly those located in rural and impoverished areas of the country, it has received plenty of criticism for being too costly and proceeding too slowly. Furthermore, unless a thorough reform of Peru's education system takes place, ICTs in Peruvian

schools will indeed prove an expensive and obsolete accessory rather than an instrument of the much needed change.

Lastly, with regard to ICTs in the political sphere, Finquelievich (2003) points out that "[n]ational governments should be model agents and consumers". In other words, the state should be leading the nationwide spread of ICTs in all spheres of society by promoting cooperation among the public, private, and civil sectors; fostering a favorable environment for the development of individual ICT projects and a national ICT industry; ensuring sufficient funding for ICT initiatives; and building and maintaining telecommunications infrastructure. On the other hand, the state should be a model consumer by demonstrating exemplary employment of ICTs within its own institutions that benefits the public administration and the population at large. In Peru, however, despite the fact that the e-government initiative is in its fourth year, the main state portal has evolved little since its introduction in 2001 and is still in the phase of offering information rather than providing online services to citizens. Many other government websites are not maintained and updated on a regular basis and contain significant design flaws. On the internal side of public administration, the use of computer technology and access to the Internet are generally low. While the institutions of the central government show average ICT use, the local governments are the worst equipped and least connected. Also, even when technological resources are available, they are often limited, outdated, and not sufficiently employed.

On a more profound level, Peru's entire political culture needs to change in order to ensure maximum efficiency and success of any e-government initiative. Just like its predecessors, the country's current political leadership has become infamous for corruption scandals, broken promises, and failed reforms.

The negative attitudes of Peru's citizens towards their political leaders have very deep roots and will not be eliminated simply by an increased use of technology. So far ICTs in Peru have improved the quality and accessibility of government services only in minor ways, have changed little about how public administration functions, and have made no significant contribution to transforming the relationship between the government and its citizens or the way in which Peru's political leadership is perceived by the general public. Above all else, Peru's government needs to regain the trust of the population at large – a task far more difficult to accomplish than digitizing certain procedures or providing public administration with more computers and access to the Internet.

We can hence conclude that Peru is still not exploiting all the benefits ICTs have to offer and is not harnessing the development potential of these technologies. Despite a few islands of modernization, connectivity and access to computer technology are generally low, and in many areas of the country telecommunications infrastructure is absent altogether. Before ICTs in Peru can truly become tools for development, computer technology and the Internet must become an integral part of business, education, and government instead of being treated like superfluous accessories. Furthermore, apart from working towards increasing connectivity throughout the country, it is important that the private, public, and civil sectors begin to take full advantage of the more advanced capabilities of computers and the Internet rather than using them for simple information exchanges or merely as tools for entertainment.

In the case of Peru, the development potential of ICTs is tremendous. They can contribute to the decentralization of power, influence, and privileges and can help overcome the isolation and marginalization of rural and poor areas, thus bringing about a more even development throughout the country. In other

words, ICTs in Peru have the potential of bringing about greater equality from a social, economic, and political perspective. However, many obstacles persist.

At the root of the problems described throughout my thesis and summarized above lies the fact that Peru is lacking "[v]ision, leadership, and promotion of organizational change" (Credé and Mansell, 1998:43), all of which are essential to the development process. With respect to vision and leadership in the process of development and technological modernization, the state bears most of the responsibility as its institutions are generally best suited and have the most authority to plan, set priorities, manage resources, and coordinate efforts. It is also the state that generally sets a national development agenda. Ideally, in the case of Third World countries, development agendas should target the most disadvantaged and marginalized groups of society, and ICTs should be used to support concrete development goals. In Peru, however, there is no unified plan and no single authority to ensure that ICT projects are carried out in an efficient, organized, and well thought out manner or that efforts and resources are not wasted. Despite the apparent awareness that ICTs can become powerful tools of development, they are not being consciously employed as such by the Peruvian state and other institutions. Consequently, the implementation of computer technology and the Internet in Peru is proceeding in a rather slow, disorganized, and piecemeal fashion. Thielemann (2003:124-25) summarizes the situation in the following way:

> the most noticeable shortcoming of Peru's Internet development is the lack of an overall IT-strategy on part of the government or any other organization involved in the process. The government focuses most of its resources on the implementation of its Plan Huascarán and neglects the overall development of the sector. There are various ongoing efforts and projects initiated by different organizations (e.g. FITEL, RCP, OAS, etc.) that all try to enhance the Internet situation in Peru and to spread the technology (especially to the rural areas). However, all of these projects are executed independently from each other and are not part of a

> homogeneous, overall concept. It would be extremely beneficial for the Internet development in Peru if these efforts and resources could be centrally directed towards the achievement of objectives of an overall strategic development plan. The main objective of this plan should be to further broaden the scope of the Internet in Peru by creating equal access opportunities and equal levels of technological development throughout the whole country. If necessary, the government should use subsidies or similar methods more frequently because they seem to be an adequate means of guiding private investments into the desired direction.

This lack of a unified vision and leadership also translates into a lack of a stable source of financing for ICT projects since it is unclear whose responsibility they are and who should be funding them. This means that Peru's technological development and the progress of its ICT initiatives depend largely on foreign loans, which may or may not be approved and often come at high interest rates, or on agreements signed with international ICT companies like Microsoft whose motives are rarely altruistic.

The last factor mentioned by Credé and Mansell (1998:43) – organizational change – is equally important. ICTs alone will not eliminate some of the most pressing challenges Peru is currently facing. In other words, even state-of-the-art ICTs will not fix poverty, corruption, or bad policies. What is needed is first and foremost a change from within. Technology must be incorporated wisely into broader reforms, but its implementation must not *be* the reform. While ICTs such as computers and the Internet can aid the development process in countless ways, they are not a panacea to all the Third World's woes.

Many of Latin America's hopes are pinned on an increased implementation of ICTs in the region, and progress is being made, however slowly it might be occurring in some parts of the continent. For the time being, the potential of ICTs as tools for development remains largely unrealized in Peru, and the impact of the various ICT initiatives discussed in previous chapters is still

limited if not imperceptible. Given the current penetration and state of computer technology and the Internet in Peru, it is difficult to be optimistic. On the other hand, there are numerous instances of average Peruvians demonstrating remarkable initiative and creativity in adopting ICTs to their own particular needs and achieving great success with extremely scarce resources. At this point in time, it is not easy to judge whether Peru will in the near future become a leader in technological modernization among the nations of Latin America or whether it will fall even further behind developing countries. Only one fact remains certain: the Information Age has arrived and for developing countries like Peru, modernization on all levels should be a top priority. Otherwise, these nations risk lagging even further behind the First World. As Al Gore (1995:6) once said, "[w]e cannot choose to delay or deny the future, we must make ready for it". ICTs and other kinds of modern technology clearly form an integral part of that future. The biggest challenge facing developing nations now is how to incorporate these new technologies into their own social, cultural, economic, and political context in ways that best suit their specific needs and that ensure the sustainability of ICT-supported development.

5.2. Unaddressed issues and future research

In my discussion of the role of ICTs in Peru's development, I have concentrated on three major areas: economic growth, education, and governance. At the same time, there are several other issues that I have not mentioned and that could serve as topics for future investigations.

For instance, one important actor that merits further attention is the non-governmental organizations (NGOs). RCP is one NGO whose efforts were fundamental to establishing firmly the Internet in Peru and spreading its

popularity among Peruvians of all socio-economic backgrounds through the very first *cabinas públicas*. While there is no other NGO currently active in Peru that is as strongly associated with the Internet as RCP, there are several other national and international organizations of this kind that work towards increasing access to ICTs in rural and poor areas on a smaller scale. Their activities and their effectiveness would certainly be worth exploring.

A large and important area of development that urgently needs to be researched is the role of ICTs in Peruvian health care. Currently, material on this matter is nearly non-existent. Despite the fact that access to quality health care is crucial to the overall development of a nation, studies and data on the use of ICTs in Peruvian hospitals and other health facilities are scarce. An investigation of this topic would thus require plenty of in-depth research based on surveys, questionnaires, and interviews, all of which would have to be administered and conducted in Peru. For this reason, I left the topic unaddressed although I believe that the results of such research would prove extremely valuable.

The cultural impact of ICTs on developing nations, particularly on indigenous communities and their ways of life, is yet another broad area that remains largely unexplored in the Peruvian context. A closer look at this subject matter could provide interesting insights into the different ways in which ICTs are perceived by members of various cultures, the expectations connected with these technologies, as well as the at times astounding and unexpected socio-cultural consequences of introducing ICTs in the Third World. Fears of Westernization resulting from technologically-driven globalization are very common among many groups, too. Also, issues related with identity, representation, race, and ethnicity are still a much debated and to a large extent unresolved aspect of Latin American cultures. It would be interesting to explore

the impact of new media such as the Internet on some of these problems and questions.

The topic of ICTs-for-development is as broad as it is fascinating, and a thorough description and analysis of all factors involved cannot be covered in one single research project. I strongly believe that it is vital to continue the research on the relationship between ICTs and development in Peru and the rest of Latin America as clearly many issues remain to be explored. The points briefly described above could serve as topics for numerous future studies. With my M.A. thesis, I sought to contribute to the research on some of the core points in the ongoing discussion on ICTs as tools for development. I hope that the conclusions I arrived at will prove valuable beyond my field of study, will benefit future research on technology in other developing countries, and perhaps will inspire further investigations in sociology, economics, or political science.

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Appendix

Illustration 1
A typical *cabinas públicas* facility in one of Lima's poorer neighborhoods
Source: Fernández-Maldonado, 2000:6.

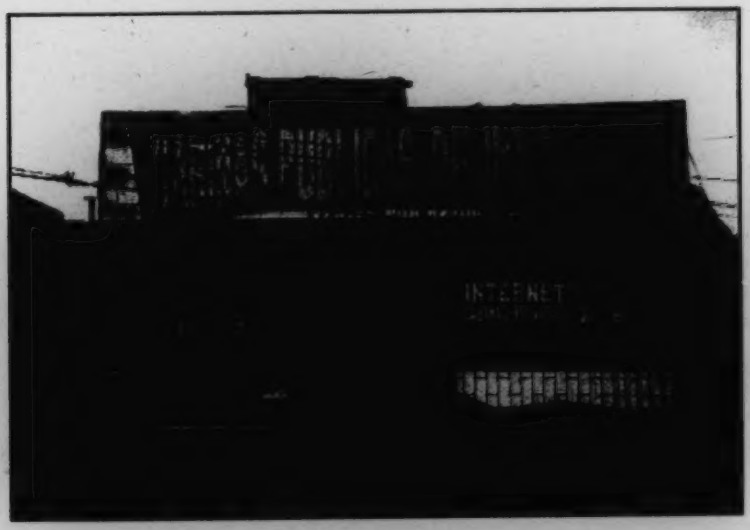


Illustration 2
The view inside a typical *cabinas públicas* facility in Lima
Source: Fernández-Maldonado, 2000:8.

Illustration 3
Screenshot of Peru's state portal: the main page

Source: Portal, 2005.

Illustration 4
Screenshot of Peru's state portal: the "Procedures" page

Source: Portal, 2005.

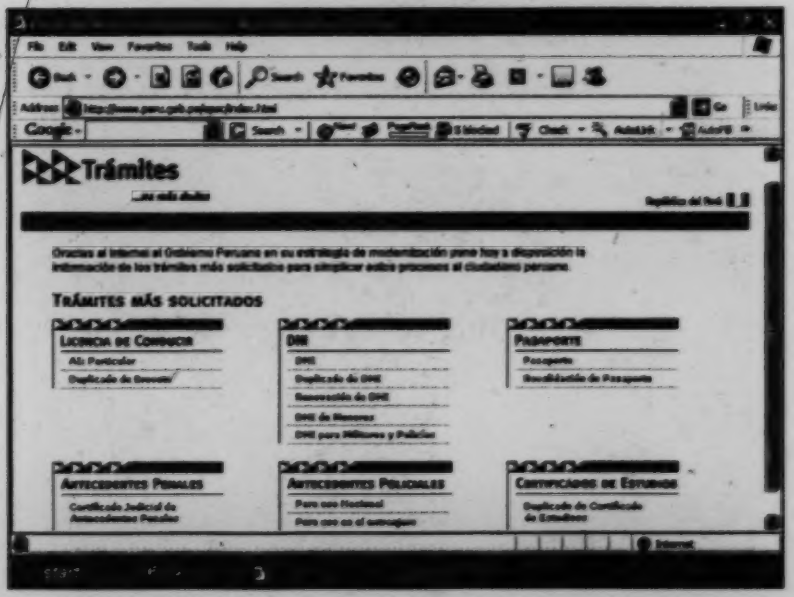


Illustration 5
Screenshot of Peru's state portal: the "Online Services" page

Source: Portal, 2005.

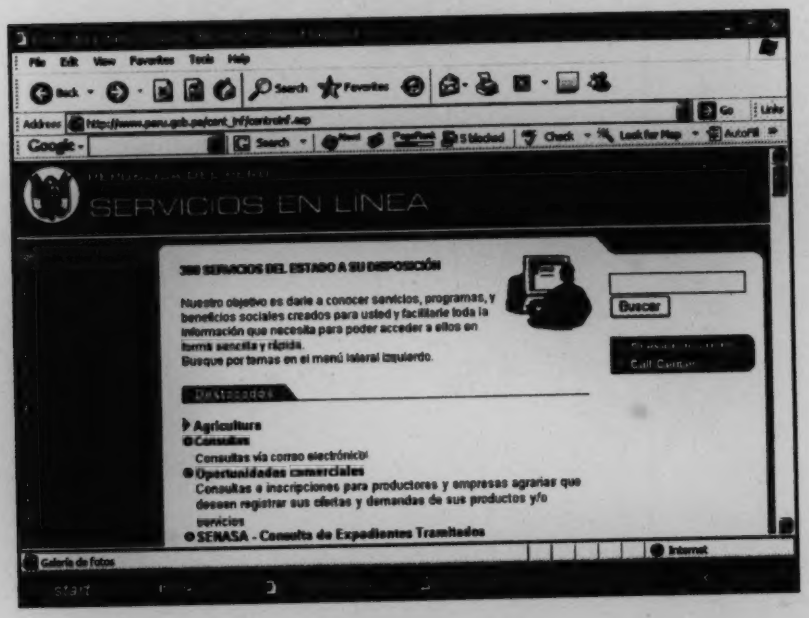
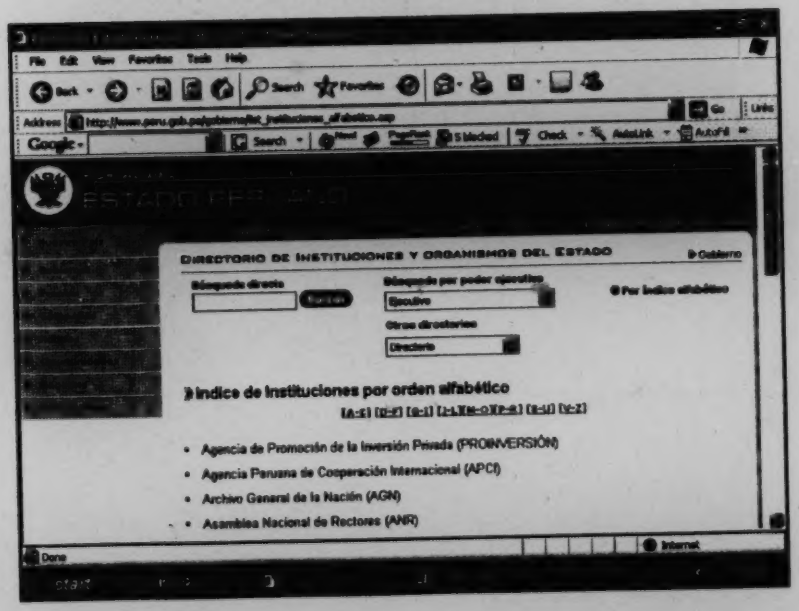

SERVICIOS EN LINEA
300 SERVICIOS DEL ESTADO A SU DISPOSICIÓN
Nuestro objetivo es darle a conocer servicios, programas, y beneficios sociales creados para usted y facilitarle toda la información que necesita para poder acceder a ellos en forma sencilla y rápida.
Busque por temas en el menú lateral izquierdo.
Buscar
Call Center
Destacados
Agricultura
Consultas
Consultas vía correo electrónico
Oportunidades comerciales
Consultas e inscripciones para productores y empresas agrarias que deseen registrar sus ofertas y demandas de sus productos y/o servicios
SENASA - Consulta de Expedientes Tramitados
Galería de fotos
Internet

Illustration 6
Screenshot of Peru's state portal: the "State Directory" page

Source: Portal, 2005.